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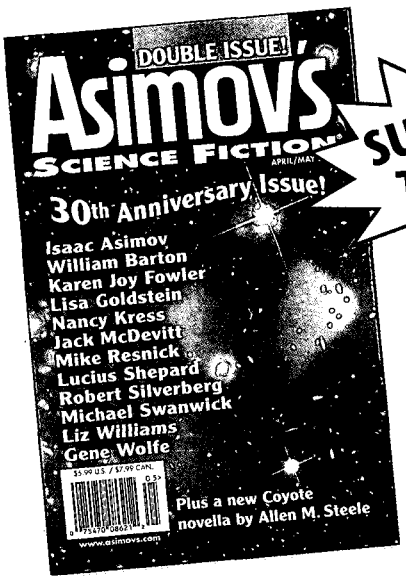

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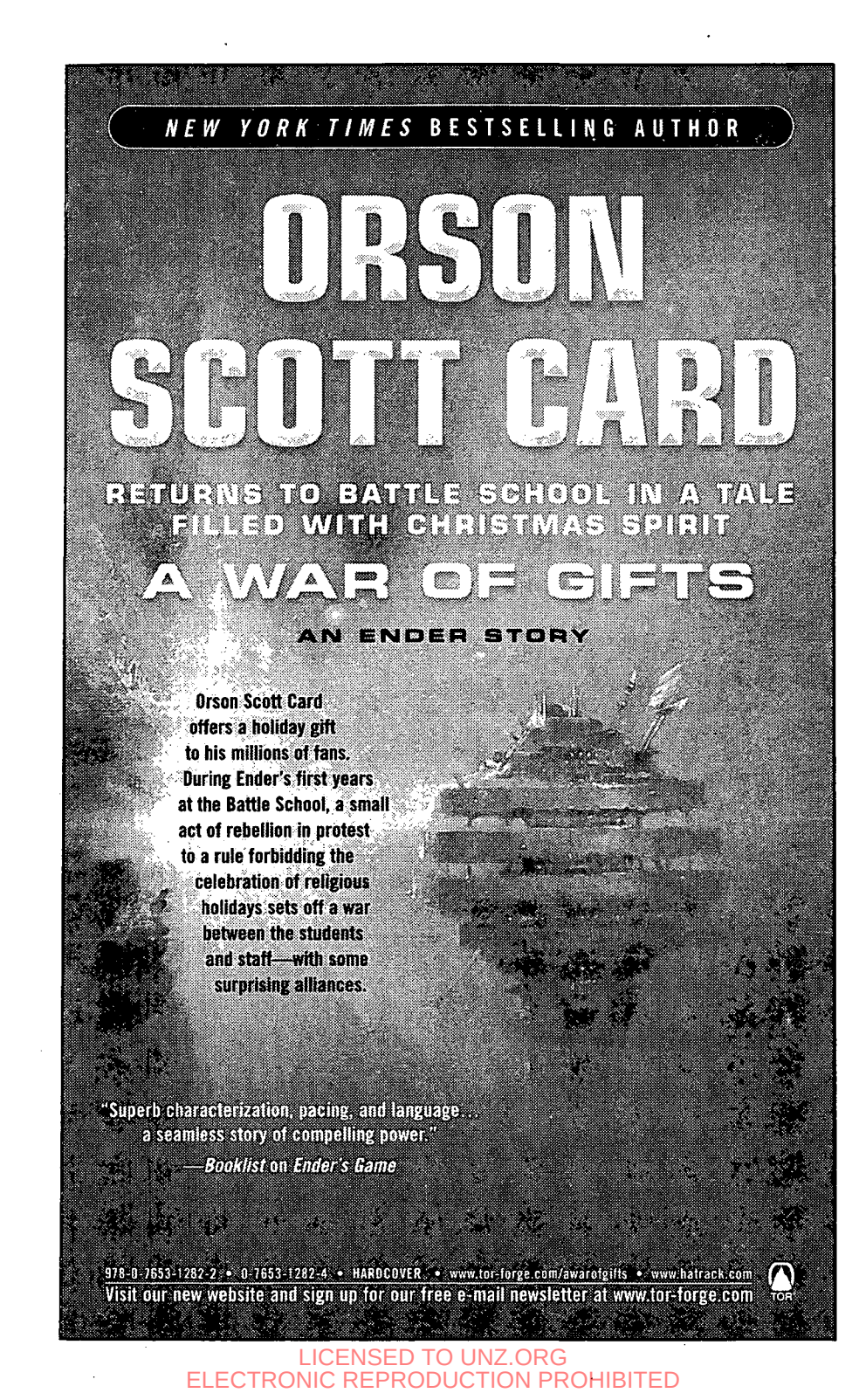

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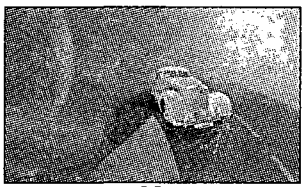

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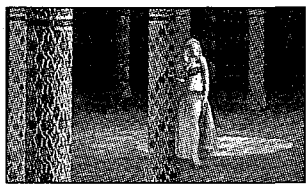

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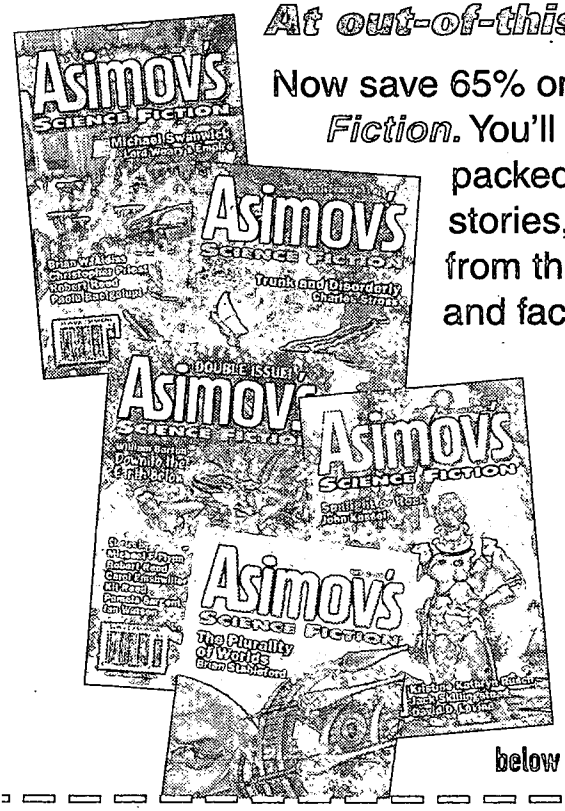

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EDITORIAL Stanley Schmidt

WHICH STITCH IN TIME?

We all know the old saying, "A stitch in time saves nine." It's an allusion using a comparison that used to be much more familiar than it is now: a small repair on a fabric that's starting to fray may prevent the need for a much larger one later, if you wait for the damage to get worse.

The cloth, of course, is only an example. The same principle applies to *any* system that you're trying to keep in good shape. An airplane, for example—or an ecosystem.

But which stitch do you make first, if a system is starting to develop problems in several places and you only have enough time or enough hands to work on one of them now? In the case of the cloth, the question is usually simple. You pick the spot that already has the most damage, or where the fabric is intrinsically weakest or subject to the most stress.

How about a more complicated case—like an ecosystem?

Invasive species are not a new problem (we ourselves are one of the most dramatic examples, dating back a long way), but they have recently become a much bigger, more widespread, and often more serious problem than in most earlier times. One of the most familiar older examples is the introduction of rabbits into Australia, where they became such a prolific pest that in 1907 a 2000-mile fence was built in Western Australia to try to keep the rabbits out of agricultural areas. We have plenty of examples of our own, both animal and vegetable, right here in the U.S. The rats that plague American cities, and at least three of their commonest birds (house sparrows, starlings, and rock pigeons), are European stowaways that came along with human immigrants and freight. Here they found congenial niches, prospered, and multiplied at the expense of native species. Kudzu vine blankets hillsides, buildings, and utility structures through much of the Southeast. Purple loosestrife, a pretty but insidious flowering plant, is crowding out native species while contributing little that native animals can use, throughout the Northeast (and spreading rapidly west). Zebra mussels threaten many aquatic ecosystems.

The introduction of non-native species into places where they don't belong is now proceeding explosively, thanks to greatly increased international travel and trade. You may think you're importing bananas, but quite likely you're also unwittingly importing an assortment of insects, rodents, spiders, snakes, and the like along with them. In some places this won't matter. No tropical snake, for instance, can last long on its own in Minnesota.

Florida is another matter. Its climate is close enough to tropical that many alien species can and do thrive there. So many Caribbean species of *Anolis* lizards have become established that finding an individual of the one indigenous species now comes almost as a surprise. "Walking catfish" are sometimes hit by cars while crossing roads. Proba-

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bly the most spectacular example of an invasive species that has become established in Florida is the Burmese python, an Asian snake that was the subject of a feature article in the July 24, 2007 *New York Times*.

The pythons have long enjoyed some popularity as pets, when they're cute, docile babies. The trouble is that they grow up, and most pet owners realize they've taken on more than they can handle long before the snakes reach the twenty-foot length and 200-pound weight that they can easily achieve. Not knowing what else to do with them, owners drop them off along country roads—and in subtropical Florida, they thrive and continue to grow toward those impressive dimensions on a diet of native mammals, birds, and occasionally other reptiles. They'll eat just about any vertebrate they can catch and swallow; and since they grow so large and are built to swallow prey much larger than most people would think they could, that includes a lot. According to Skip Snow, a biologist working in Everglades National Park and quoted in that *Times* article, creatures whose remains have been found in feral pythons there range from mice and rats to egrets, bobcats, deer, and alligators.

How big a problem is it? Well, at first glance you might think it's not all that bad. "Only" about 350 have been found in the park since 2002; and snakes typically eat, on average, only one meal every week or so. However, they also reproduce in large numbers—dozens at a time, for this species, and they are known to be doing so in the Everglades. Furthermore, biologists probably only find a small fraction of the number present, and there are still an estimated several thousand pets in the state, many of which will sooner or later find themselves joining their kin in the wild.

Snow understandably considers it a serious and rapidly growing problem—and it's only one of many. But eradicating an invasive species is an extremely difficult, expensive proposition. Nobody tries to stamp out *every* invader, because that would be practically impossible—and many will take care of themselves anyway. Only a fraction of the invaders that escape into new environments thrive there, so why waste scarce money and resources on problems that will solve themselves?

People only get concerned enough to try to do something when they notice that a species has already established itself and is spreading and reproducing fast enough to be a threat—but by then it's usually too late to have much hope of stopping it. As David M. Lodge, director of the Center for Aquatic Conservation at the University of Notre Dame, puts it, "When it comes to importing live organisms, our policies are entirely reactive."

And when I read that, I thought, "Why? Why can't we instead try to make

Analog Science Fiction and Fact (Astounding), Vol. CXXVIII, No. 3, March 2008. ISSN 1059-2113, USPS 488-910, GST# 123054108. Published monthly except for combined January/February and July/August double issues by Dell Magazines, a division of Crosstown Publications. One-year subscription for $43.90 in the U.S.A. and possessions, in all other countries, $53.90 (GST included in Canada) payable in advance in U.S. funds. First copy of new subscription will be mailed within eight weeks of receipt of order. When reporting change of address allow 6 to 8 weeks and give new address as well as the old address as it appears on the last label. Periodical postage paid at Norwalk, CT and additional mailing offices. Canadian postage paid at Montreal, Quebec. Canada Post International Publications Mail. © 2006 by Dell Magazines, a division of Crosstown Publications, all rights reserved. Dell is a trademark registered in the U.S. Patent Office. Protection secured under the Universal Copyright Convention. Reproduction or use of editorial or pictorial content in any manner without express permission is prohibited. All stories in this magazine are fiction. No actual persons are designated by name or character. Any similarity is coincidental. All submissions must be accompanied by stamped self-addressed envelope, the publisher assumes no responsibility for unsolicited manuscripts or artwork.

POSTMASTER: Send change of address to: ANALOG SCIENCE FICTION AND FACT
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IN CANADA RETURN TO: Quebecor St. Jean, 800 Blvd. Industrial, St. Jean, Quebec J3B 8G4
Executive Office: Penny Press, 6 Prowitt St., Norwalk, CT 06855
Editorial and Advertising: Analog Science Fiction and Fact, 475 Park Avenue South, New York, N.Y. 10016
Subscriptions: Analog Science Fiction and Fact, 6 Prowitt Street, Norwalk, CT 06855.

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a reasonable guess at which stitch in time is likely to save nine?"

Or, in ecological terms, do we really have no idea which introduced species are most likely to get loose and run amok? If we have, or could get, such an idea, maybe we could save money in the long run by concentrating relatively small amounts of money on controlling the most potentially dangerous species before they become well established, instead of pouring fortunes into losing battles after that has happened.

Our problem now is that we know from experience that a certain fraction of all introduced species will spread enough to become a serious problem, but we don't know *which* fraction. We know it's significantly less than unity, which is a point in our favor. But to use that knowledge, we need to be able to predict with a reasonable degree of confidence how well a particular species will do when introduced into a particular new environment. With a good enough understanding of biochemistry, ethology, and ecology, we ought to be able to do that.

I realize that's a tall order, especially the part involving ethology (animal behavior). In first approximation, understanding the workings of an established ecosystem is largely a matter of biochemistry and energetics. But what actually happens if you throw an organism into an environment it wasn't evolved for is hard to predict. Even if you think you have a good evolutionary explanation for its behavior in its native environment, it's hard to know how it will behave in a place where conditions are different—for example, lacking the food sources it's programmed for, but offering new ones that it may or may not learn to recognize as such. Some animals, such as coyotes, are very adaptable and learn to thrive in a wide range of new environments. Others, like giant pandas, are entirely dependent on a single very small group of food species.

But even though the challenge is large, it's important enough that it might be worthwhile to focus more effort (and funding) specifically in the direction of "predictive ecology."

We often hear people speak of "hard" and "soft" sciences, defined according to how systematically and accurately they can use theories based on old observations to predict the results of new ones. Physics and chemistry are the classic "hard" sciences, their practitioners

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First issue of *Astounding* January 1930 ©

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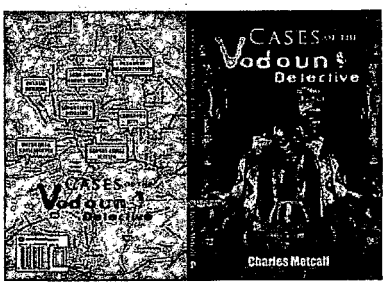

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routinely making quite precise and accurate predictions of such things as the flight path of a rocket or the yield and energy requirements of a reaction. Sociology, economics, and psychology are often thought of as "soft" because their practitioners can seldom make precise predictions that prove accurate under test. (Though in their defense, they're dealing with extremely complex systems. They're working on it).

Biology lies somewhere between. At the molecular and cellular level, it has made impressive strides and in many cases it really can make quantitative and meaningful predictions. At the whole-organism level it gets more difficult and the results shakier. At the level of ecosystems—large numbers of plants and animals interacting—it gets *much* harder and less predictive.

But, difficult as it is, that's precisely one of the areas in which we most need an improved predictive ability. ■

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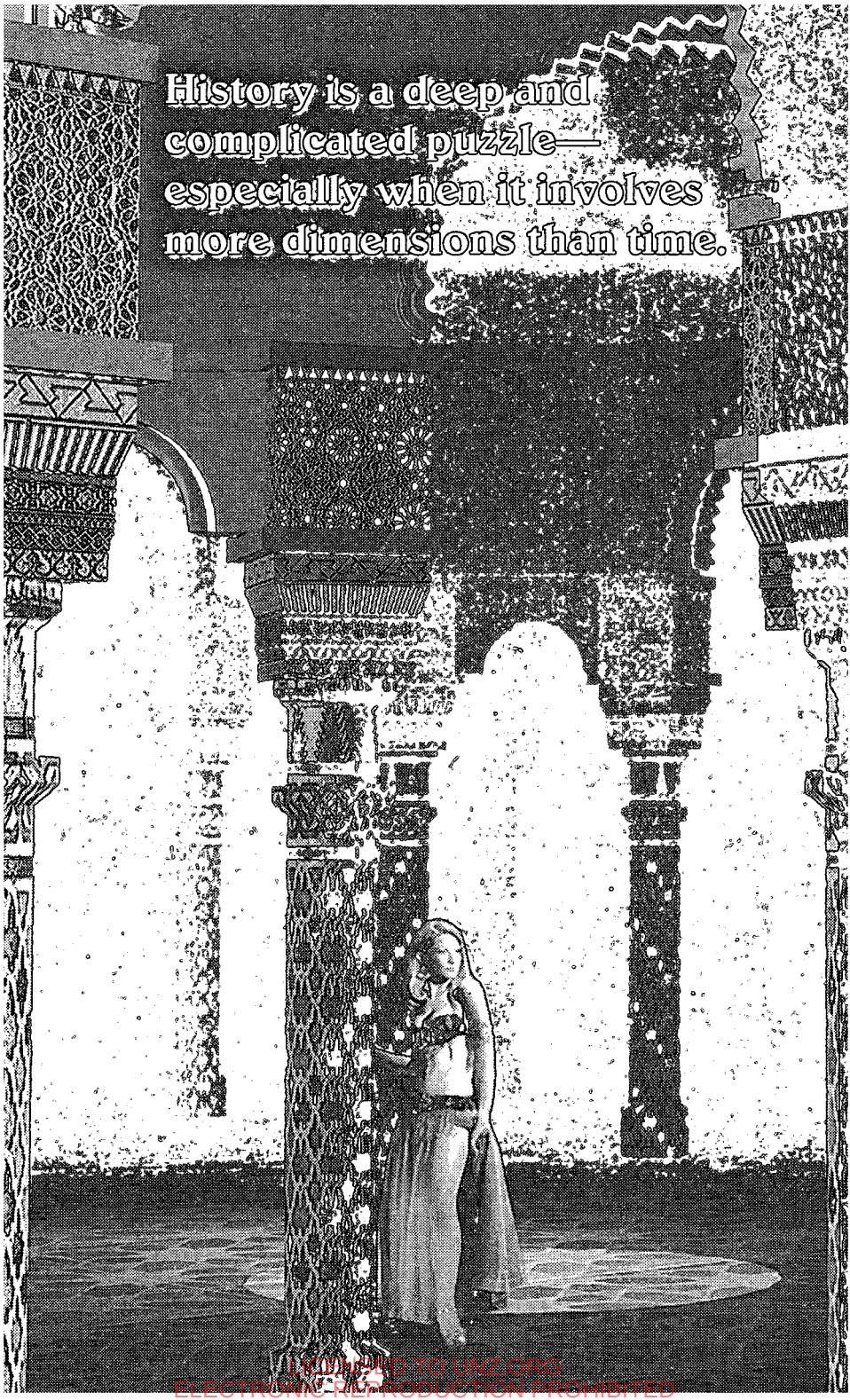

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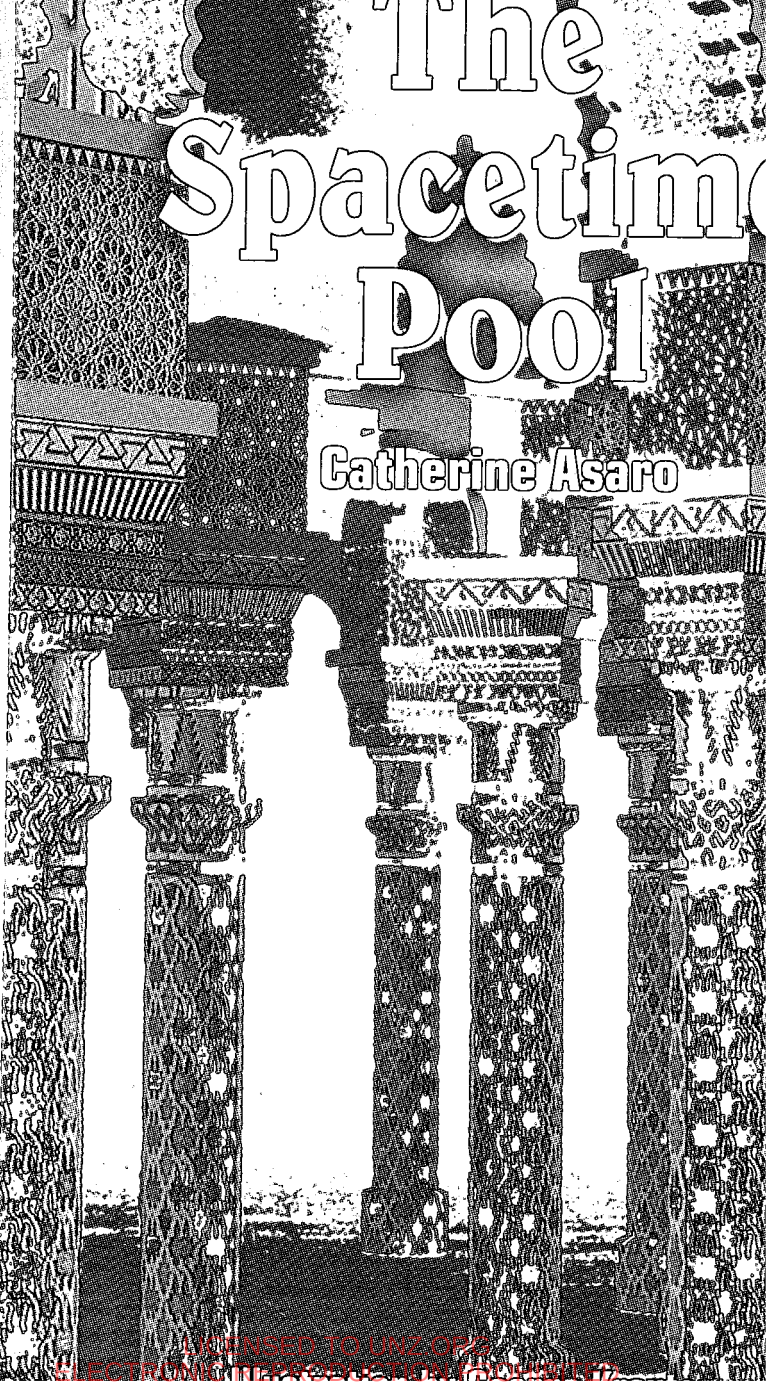

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I

Appalachia

The hiker vanished.

Janelle peered at the distant hill. She could have sworn a person had appeared there—and disappeared just as fast. Perhaps it was a trick of the wind. The rhododendron bushes on the hillside where she sat undulated in the breezes like a dark ocean frothed with purple flowers, and a hum of cicadas filled the air. The Great Smoky Mountains rose in the distance, green and gray against a late afternoon sky as blue as a cerulean glaze.

She shifted her weight uneasily, wondering if she should have come out here alone. Her hair blew across her face in a swirl that reminded her of yellow corn in the fields back home. The breeze whispered against her arms and rippled the summer dress she had worn instead of sensible hiking clothes. Right now she probably resembled some forest creature more than a new college graduate. She smiled at the image that conjured up: Janelle the wild-woman stalking into math class, strewing leaves and equations. Then her disquiet returned, like a hawk gliding in the sky, circling a rabbit, ready to plunge.

"Oh, stop," she muttered, annoyed at herself. She pulled her hair out of her face. Birds wheeled above the figure on the next ridge—

Someone *was* there. She strained to see better. A man was standing on that hill with his back to her. As she rose to her feet, he turned in her direction.

Then he compressed into a line and vanished.

Whoa. Janelle squinted at the hill. She must have mistaken whatever she had seen. She had no wish to share her solitude, but curiosity tugged at her. She hiked up the hill, headed back to the trail, uncertain whether to investigate the vanished fellow or return to her car. Although it would take thirty minutes to reach the parking lot, she should probably go back; the afternoon had cooled as it aged, and her flimsy dress couldn't stave off the chill. Seeking an escape from her hectic life, she had left her cell phone and purse in the car, taking nothing more than her keys.

The leafy canopy of an old growth forest arched above her. Wood chips crackled under her feet, and a red squirrel skittered up the trunk of a basswood. Stretching out her arms, she turned in a circle, her eyes closed. Sweet blazes, she loved these mountains. Laughing, she opened her eyes. Life was good. She had finished her math degree at MIT just a few days ago, and it felt great.

Like a shift in a sea current, her mood changed. She had no one to share her happiness. It had been two years since her father's assassination in Spain. Her mother and brother had unexpectedly joined him for lunch that day, and the explosion that destroyed his car had taken them as well, her entire family. Even now, the pain felt raw.

Janelle inhaled deeply. She would survive this moment, as she had all the others, until the grief became bearable.

"Janelle?" a voice asked.

What the . . . ? She whirled around.

A man stood several paces away. He resembled the figure from the hill, though she hadn't seen him well enough to be sure this was the same person. She stepped back. He had only said her name, but given that they had never met, that was plenty to make her nervous.

His presence did nothing to allay her unease. He was too tall, maybe six foot six, with a muscular physique that reminded her of her vulnerability. His clothing was strange. She had nothing against unconventional self-expression, but in some subtle way, this went beyond that. The blue of his shirt vibrated in the shadowed forest, as vivid as an ocean where sunlight slanted through the water. His black pants were tucked into black boots. Silver links set with abalone gleamed on his shirt cuffs and in the silver chain around his neck. Well-trimmed hair brushed his shoulders, glossy and black. It wasn't the length that surprised her, but the gray at the temples.

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Although obviously hale and fit, he seemed rather old to adopt such styles. Then again, just because she knew no one his age who made such fashion statements, that didn't mean it never happened.

What compelled her the most, though, was his face. His high cheekbones and strong nose, and the dark brows arching above his gray eyes, made her think of a senator in the Roman Empire. He projected a sense of contained force.

Then she saw what hung from his belt. Ah, hell. *Dagger* was too tame a word. The sheath for the knife stretched as long as her forearm.

"I didn't mean to startle you." His gravelly voice had an unfamiliar accent, harsh and throaty. "You are Janelle Aulair, aren't you?"

She stood poised to run. "Why do you want to know?"

"I was sent to look for you."

With relief, she realized what must have happened. Ben, the grocer in town, had sent him to check on her. Ben always worried when she came up here alone. The last time he had sent his sister and brother-in-law, and they had startled her the same way.

"Have we met?" she asked. "At Ben's?" She thought she would remember someone so striking, but maybe not.

"Never," he said. Then he added, "Destiny requires your presence," as if that explained something.

Destiny indeed. She should get back to her car. He hadn't threatened her, but if that changed, she could surely outrun someone his age. She stepped to the side—

"No, wait!" he said, lunging forward.

Startled, she jumped away—

Darkness enveloped Janelle, muffled and cold. Muted voices echoed, calling, fading. Then the light brightened. She stumbled on the sand and barely caught her balance.

Sand?

She looked up—and froze.

***

II

The Riemann Gate

A white beach stretched around her, dazzling in the bright day. Waves crashed a few yards away, and their swells glinted in the slanting rays from the Sun, which was low in the sky. The ocean stretched to the horizon, wide, blue, and endless.

"What the blazes?" Janelle spun around—in time to see the man appear out of thin air.

He came out of nothing, taking a long, slow step. His progress was slowed to a surreal speed, and his body flickered as if he were a projection of light. It *couldn't* be real. He had to be doing this with mirrors. Either that, or she had overworked herself in school more than she realized, and her mind was lodging a protest by wigging out.

The man solidified. For a moment he just stood, focusing on her. He seemed as disoriented as she felt. The large tendons in his neck corded under the chain he wore, and the Sun caught gleams from the abalone. The metal looked like real silver. The contrast of his powerful build and the jewelry unsettled her; no one she knew wore such items, let alone a man this daunting. It wasn't right or wrong, just eerily different.

"Are you all right?" he asked.

What a question. Her heart rate had ratcheted up and her head was swimming. "Is this a movie set?" If he had equipment to create this illusion, she should have seen it, but she grasped at the possibility like a swimmer clutching at driftwood in the ocean.

"A moving set? No." He rested his hand on the hilt of his knife and scanned the area. "Did anyone see you?"

She glanced at the knife, then at his face. "I don't want trouble."

"Nor do I." He stepped toward her. "We shouldn't stay here."

She stepped back. "Why? Where is this? What happened to the mountains?"

He spoke carefully, as if she were breakable and his words were hammers. "They are elsewhere." He indicated a line of

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straggly trees up the beach, where the sand met a sparse forest. "We must go. We will be safer if we aren't in plain view."

"Safer from what?" She wasn't going anywhere with him.

"Raiders." He scanned the beach, poised as if he were ready to fight. Wind blew his hair back from his face, accenting his prominent nose and strong chin. His profile looked like it belonged on a coin. "We must leave before they come."

"I'll just go home," she said.

He turned toward her and she was acutely aware of his height. Large men rattled her. They lived in another dimension, one where you could use the top of bookcases and see over the heads of a crowd. They loomed, and he was doing it much too well.

"I'm not sure you can," he said. "This last time, I barely made it through before the gate closed."

"What gate?" Sweat was gathering on her palms. "Who *are* you?"

"You may call me Dominick."

"What do you want with me, Dominick?"

"You are part of a prophecy," he said, as if that were a perfectly reasonable statement. "Before my brother or I was born, it was foretold that whichever of us married you would kill the other."

Marriage and murder. Right. She should have listened to Ben and not gone hiking alone. "Don't play with me." Her voice cracked on the last word.

His strong features softened unexpectedly. "I am sorry. I didn't really expect the gate to open."

"My friends are waiting for me." She was talking too fast. "If I don't show up, they'll phone the police." In truth, no one expected her for days. But he didn't know that. She hoped.

"I don't know what is phone," he said. "But we *must* go." He strode forward.

As Janelle whirled to run, the sand shifted under her feet and she tripped. Dominick easily caught her. Twisting in his grip, she raked his arm with her fingernails, and the two of them nearly fell into the sand. He ended up swinging her in a circle with one arm around her waist. He wrapped the other arm around her torso, pinning her while he bent over to hold her in place. He felt as if he were built from iron. She struggled, and he tightened his hold.

"Janelle, listen." He spoke urgently. "I won't hurt you. But if we stay here, we could be killed. Outlaws have been raiding homesteads in this area. You're a beautiful woman. If they find you with no defense except me, you would be in far worse trouble than you think I might cause you. And I would be dead."

She didn't want to listen. But she had to do something. What if he was telling the truth? What if he *wasn't?* If she made the wrong choice, could one or both of them end up dead?

"Janelle?" he asked.

She took a deep breath. "All right." For now.

He released her, then grasped her upper arm and set off for the trees. She had to run to keep up with his long-legged stride. So much for her assumption that age would slow him down; he could easily outrun her. His large hand engulfed her arm. His grip could have bruised, but he didn't let it. The contrast between the contained violence of his personality and his careful touch confused her.

The fine-grained sand showed little trace of their progress. They soon reached the forest and strode under its sparse cover. He kept up the grueling pace as they plunged into the deepening woods, until a stitch burned in her side.

Dominick angled through a tangle of bushes into a denser knot of trees. As they pushed through the bushes, he used his knife to cut away branches. The thicker foliage screened them from view, but it wasn't until they reached the center of the glade that he slowed down. He motioned her toward a boulder that jutted up to about waist height. Sitting on another, he planted his boots on the ground, braced his palms on his knees, and heaved in large breaths. Janelle stayed on her feet,

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too nervous to sit as she struggled to catch her wind.

"We can rest here," he said as his breathing settled.

She rubbed her arms, feeling cold despite the heat. It was much warmer than in the Smoky Mountains, and she didn't want to dwell on the implications of that fact. "I don't understand how you know me."

"Only through the prophecy." He watched her as if she were the apparition rather than this entire place. "I didn't really expect to find you."

"How do you know I'm the right person?"

"You look like the vision in the Jade Pool. It's near a mountain lodge where my father took his seeress." Sarcasm edged his voice. "Apparently she made better predictions when she was alone with him in secluded retreats."

From his tone, she suspected he had been painfully aware in his childhood of his father's involvement with his "seeress." Choosing tact, she said only, "What did she predict?"

"Just days before my mother gave birth for the first time, she showed my father a vision of you. She said Maximillian and I would be his oldest sons, that whichever of us married you would kill the other, and that if either of us tried to kill you, that brother would die."

"That's horrible."

Dryly he said, "My parents weren't delighted with it." He studied her face. "The scribes copied your image from the pool. But you are much younger than the woman in those portraits."

"I doubt they were pictures of me."

"It's more than appearance," he said. "The gate was supposed to bring me to you. It took me three tries to get it right, but it did work. And the seeress knew your name. Janelle Aulair."

"You could have looked me up on the Internet."

"What is the Internet?"

Like he didn't know. Maybe next he would try to sell her swampland in Florida. "It's not important. Just tell me how to get back home."

He dropped his hand to his belt and set his palm over a disk. It differed from the abalone circles; this one had a metallic sheen. He stared at the ground, his gaze unfocused.

"Dominick?" she asked.

He looked up at her. "The gate doesn't open."

She pushed back her growing fear. "That's convenient."

"It's true." He ran his fingers over the disk. "Do you feel anything?"

"Nothing."

"I'm trying to create the gate where you're standing."

She didn't know what to think. "How did you learn to use it?"

"One of the monks told me."

Right. Monks, too. "How did he find out?"

"I don't know."

"A description has to be somewhere. Books, files, storage."

He seemed oddly bewildered. "You mean a library?"

"Yes!" If they had web service there, she could email someone for help.

"I have one at my home," he said.

The last place she wanted to go was his house. "A public library would be better."

"I don't know what that is."

She couldn't believe him. That he sounded sane made none of this more plausible. "And you have no idea how this gate works?" she challenged.

His gaze flashed. "Of course I do. It's a branch. From here to your mountains."

"A tree, you mean?"

"No. A branch cut to another page. Your universe is one sheet, mine is another."

She gaped at him. "Do you mean a *Riemann sheet?* A branch cut from one Riemann sheet to another?"

"That's right." He hesitated. "You know these words?"

She laughed unsteadily. "It's nonsense. Not the sheets, I mean, but they're just mathematical constructs! They don't actu-

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ally exist. You can't physically go *through* a branch cut any more than you could step into a square root sign."

He was watching her with an expression that mirrored how she had felt when he told her about his prophecy. "I have no idea what you're talking about."

"Complex variable analysis." She felt as if she were in a play where she only knew part of the script. "A branch cut is like a slit in a sheet of paper. It opens onto another sheet. I suppose you could say the sheets are alternate universes. But they aren't real."

"They seem quite real," he said. "When you went through the gate, it threw off my calibration. I had set it to come out at my camp." More to himself than to her, he added, "I hadn't actually expected to *leave* the camp."

"Tell you what," Janelle said. "How about you and your brother find wives here? I'll just drop out of the picture." She thought of what he had said about his father. "Unless you're already married. Because if you're pulling this bit looking for some fun on the side, forget it."

"Neither Maximillian nor I is wed. I have had concubines, though not in some years."

"Concubines!"

He grinned. "You don't like that?"

Just like a guy, to be pleased because he thought she was jealous. "Oh, cut the sexist crap."

He had the audacity to look intrigued. "What does 'sexist' mean? Is it to do with love-making?"

"No. It means I should go back to Tennessee."

His voice softened. "This world would be much poorer, to lose such beauty as yours."

"Don't." For some reason, it angered her that he actually sounded sincere with that line. Or maybe the anger masked her fear. Right now, he could do whatever he wanted with her.

"Max wouldn't give you a choice." He was no longer smiling. "If not for the prophecy that we would die if we killed you, he would probably execute you on sight."

An unwelcome memory jumped into her mind: she had learned about the deaths of her family from the media. Someone with too much ambition or too little compassion had leaked the story, sensationalizing it as an "execution." Janelle had been visiting a girlfriend in Virginia during a school break, and the news had gone public even as government officials scrambled to find her.

Dominick spoke quietly. "Your face looks like a dark cloud passed over it."

She shook her head, unable to answer.

"I do regret all this." He stood up and lifted his hand, inviting her to leave the glade. "Are you rested enough to go on? Let me at least bring you to my home, as my honored guest."

Janelle didn't want to be his guest. But she was beginning to absorb that this might be real, and she doubted staying in the glade would help her escape.

The Sun was setting when they emerged from the screen of bushes. The world had darkened and blurred, as if they saw it through old glass on the seashore, brown and rounded by tumbling waves.

Dominick set off along a faint path scattered with leaves. They had only gone a few yards, though, when he turned to her and paused, listening. Then he spoke in an urgent whisper. "*Run.*"

She took one look at his face—and broke into a sprint.

III
The Transform Palace

Janelle raced through the woods, and Dominick's boots thudded behind her. Then she tripped on a jutting rock, and he plowed into her. Holding onto her, he lurched past a tangle of wild berry bushes and fell behind a large boulder and the bushes. He twisted in mid-air and landed on his back, cushioning their fall so she came down on top of him. Her breath went out in a rush. It happened so fast, she had no time even to tense up.

For one second, he held her in a vise-

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like embrace. Then he sat up fast, rolling her off his body and onto her stomach. She pushed up on her hands, but when he laid his palm on her back, she stopped with her head raised. He crouched next to her, his knife drawn, his head tilted as if he were listening to the distant waves. Her surge of adrenalin sharpened her hearing, and she caught the shushing of hooves on sand. Dominick raised his dagger in a single sure motion, the blade glinting in the last rays of the Sun.

Hooves stamped nearby. Janelle stayed silent, though surely they could hear the thud of her heart. Voices spoke in a patois of heavily accented English sprinkled with unfamiliar words. Straining to understand, she recognized they were talking about the "two on the beach," that they would finish off the man and take the girl. When she heard what they wanted to do with her, bile rose in her throat.

The voices moved away, until she heard only waves on the beach. Dominick spoke under his breath, no words she recognized, what sounded like an oath. She breathed out, aware of her rigid posture.

"I think we can go," he said in a low voice.

A reaction was setting in as Janelle comprehended she might truly be stranded in this violent place with no anchor except this stranger. "I can't," she whispered.

"It will work out." Despite his rough voice, he had a kind tone. "Come with me, Janelle. I will do well by you."

Get a grip, she told herself, and climbed to her feet. "I'm all right."

Standing with her, he inclined his head. He lifted his hand as if to touch her face, but when she tensed, he lowered his arm.

They set off again, and the ocean's mumble receded as they went deeper among the trees. The woods thickened into a heavy forest, and tufts of wild grass stuck up in the soil. Dusk came like a great beast, one barely noticed until it spread its wings, darkening every copse and glade. Luminescent bottle flies hummed among the trees.

Dominick drew her to a stop. Holding his fingers to his mouth, he gave a whistle that rose and fell in an eerie tune. A bird answered his call.

"Hai," a low voice said.

Janelle started. A man had appeared under a nearby tree. He wore leather armor and a dagger similar to Dominick's, but without the silver or abalone. He also had an "extra" that made her mouth go dry, a monstrous broadsword strapped across his back with its hilt sticking above his shoulders.

Dominick spoke in the same dialect used by the men who wanted to kill him. It sounded like "Hava moon strake camp," but she thought he meant, "Have the men strike camp." Although she didn't understand the other man's response, she saw the deference in his bow. The man glanced at her with curiosity, then withdrew into the trees and vanished as silently as he had come.

She and Dominick continued on, and although she saw no one else, she didn't think they were alone anymore. They soon entered a clearing of trampled grass. Several tents stood on the far side, and men moved in the trees beyond, soldiers it looked like, in leather armor. Most were tending animals. Their mounts resembled horses, but with tufts for tails. Each had two horns, one on either side of its head, with the tips pointing inward. Some of the men wore helmets with similar horns. The scene had a dreamlike quality, all in the dusk, with mist curling around the animals. But the cooling air on her arms and legs and the pungent smell of wet grass were all too real.

The men greeted Dominick with respect. Although Janelle had trouble deciphering their words, she understood their intent. They were preparing to leave.

And she was going with them.

Fog muffled the night. Janelle sat in front of Dominick on one of the two-horned animals, which he called a biaquine. Starlight, his mount, had a silver coat with stiff hair. He changed the animal's saddle to a tasseled blanket woven in

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heavy red and white yarn so Janelle could more easily sit with him. A few scouts went on ahead, but the rest of the men stayed together, with extra biaquines to carry the tents and other supplies.

Fear and curiosity warred within Janelle. She had agreed to go with Dominick because she saw no other viable choices, at least not where she stayed alive and healthy. But she didn't trust him.

They passed through veils of mist, climbing into the mountains. Her muscles ached from the unfamiliar ride. Moonlight lightened the fog, and she strove to keep track of landmarks that loomed out of the night: a gnarled tree with two trunks or a weathered statue of an elderly man in a niche of rock. Her ties to home were growing tenuous, unable to compete with the reality of this impossible place.

Dominick put his arms around her waist, so she didn't fall off the biaquine. At first she sat ramrod straight. Gradually, though, Starlight's rocking gait lulled her. Nor did Dominick act in any way to make her uncomfortable. She had forgotten how comforting it felt just to be held. Her mother had always been effusive with affection, and although her father had been less demonstrative, he had never let them doubt his love. She had grown up secure in those close-knit ties. One instant of violence had shattered everything. Drowning in grief, she had withdrawn from human contact; in the past two years she had barely touched another person.

Dominick had a strange request. He wanted a curl of her hair. When she agreed, he pulled out his dagger. She stiffened, her gaze riveted on the long blade as it glittered in the moonlight, but he only cut off a small tendril. He gave it to one of his riders, who carefully placed the strands in a packet of cloth. Then the man took off up the trail, galloping ahead of their party.

"What'll he do with it?" Janelle asked.

"My monks will examine it," Dominick said. "To see if you are who I think."

"How can they know from a lock of hair?"

"They have . . . spells."

"Spells?"

"Well," he amended, "so they say."

From his tone, she suspected he didn't believe it any more than she did. She just hoped his monks didn't decide her hair had demonic properties.

Exhaustion was catching up to her, but she feared to rest, dreading what she might find when she awoke. She had rarely slept enough during school, often studying late into the night. It paid off; she earned high marks, even the top grade in Mathematical Methods of Physics. Now her simple pleasure in a job well done seemed forlorn.

An owl hooted, its call muted by the fog. Janelle shuddered.

"Are you cold?" Dominick asked.

"I was thinking of home."

Regret softened the hard edges of his voice. "I am sorry about this." After a pause, he added, "But I would be lying if I denied I am glad you are here. I never really believed this would happen."

"Prophecies aren't real." She watched the biaquines plodding ahead of them on the trail. "A rational explanation has to exist."

"Truthfully?" he said. "I don't think the seeress made that prediction. It was Gregor, a monk from the monastery. He is the one who can read the Jade Pool." His voice tightened. "Father's soothsayer had never even been there before. She stayed at the palace."

"Palace?"

"Where my brother is."

"Does he work there?"

He gave a bitter laugh. "You could say that."

"What does he do?"

"He is the Emperor of Othman."

Good Lord. What had she landed in? "You're the brother of an emperor?"

"Yes." He said it simply, just verifying a fact. "He was born first."

If neither he nor his brother had married, that suggested neither had legitimate offspring. "Does that mean you're his heir?"

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"For now. Until he sires one."

"Sweet blazes," she murmured. "I've never heard of Othman."

He swept out his hand as if to show her all of the land. "The provinces stretch from the snow fields in the far north to the great gulf in the south. Maximillian rules it, and I govern the Atlantic Province under him."

"The entire continent?" It sounded like Canada and North America.

"Only the eastern half. Britain has the rest." In a voice that sounded deceptively soft, he added, "For now."

A chill went through her. "And later?"

"That depends on what happens with Max."

From his tone, she suspected that if he ever became emperor, he would kick out the British and absorb their territories. What a strange history for the colonial revolution.

"Your brother is afraid you're after his throne," she said.

"Supposedly, whichever of us marries you will rule Othman."

"This is crazy. I have nothing to do with either of you."

"Not according to the seer."

Or the politicians, more likely. "Dominick, surely you see this so-called prophecy is a trick, one guaranteed to set you and your brother against each other. It's bunk."

"Bunk?"

"Lies. Moonshine."

"Moonshine." Wryly he added, "An apt image."

Janelle had used the word on instinct, and now she regretted it. It evoked sweetly faded memories of her southern childhood: grits, biscuits and gravy, and bluegrass music. Her family had later moved to Washington, D.C. and then Europe, but the girl who loved country ham and the unique twang of a steel guitar was still inside of her. Her memories glimmered of the golden hills she had wandered during late summer days, spinning the enchanted dreams of youth. She couldn't let herself think she might never again see them.

"I would agree it is 'moonshine,'" Dominick was saying, "except everything else in the prophecy has come true. It foretold the birth of eight children to my parents. Max and I have six siblings, and they fit every detail predicted." His breath condensed in the air, spuming past her. "Gregor gave my father a sealed letter, to be opened after father's death. Father died of pneumonia ten years ago, three days after his sixtieth birthday. After the funeral, Maximillian opened the letter."

"What did it say?"

He answered quietly. "That my father would die of pneumonia three days after his sixtieth birthday."

She shivered. "That's eerie."

"Indeed."

"You and Maximillian can never trust each other."

"True. Not that I would trust him anyway."

"Why not?"

"He craves power."

She suspected that applied to Dominick as well. "Why are you so certain it's me in that prophecy? You've only seen drawings of an older woman."

"We will verify your signature."

"You've never seen me write, I'm sure."

"Not writing. It's hard to explain."

"Try."

He paused for a moment. "Your signature is inside your body. It has forty-six characters, half each from your father and mother. You can't see it, I think because it is too small." He nuzzled the top of her head. "It determines everything about you, from the color of your eyes to whether you are a man or a woman."

The touch of his lips on her hair startled Janelle. It was a simple gesture, but that just made it more intimate, as if they took such affections for granted. Attractive he might be, but he was too threatening. She started to tell him to stop, then froze as she realized what else he had said. The "signature" sounded like DNA. Based on what she had seen, she wouldn't have expected his people to know genetics at the molecular level needed to identify a per-

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son. Then she gave a frayed laugh. She didn't believe they understood DNA, but she accepted gates to other universes?

He lifted his head and spoke stiffly. "What is funny?"

Belatedly, she realized how her reaction must have sounded. "Dominick, I wasn't laughing at—" She foundered at the word "kiss," which felt much too awkward, and wasn't exactly what he had done, anyway. So she told another truth. "I'm tired. Nervous." Softly, she added, "Don't push."

He let out a breath. "It is my fault you were ill prepared. I wasn't ready, either. I had never before used the gate."

"You must have studied it." How else could he have found her?

He shook his head, or at least his hair rustled; seated in front of him, she couldn't see his face.

"I just use the tools Gregor gave me," he said.

"The disk on your belt."

"Yes. Except it no longer does anything."

"Maybe I can get it to work."

She expected him to refuse. Instead, he took his arm away from her waist, and she heard a click. Then he pressed a metal plate into her hand. It had a diameter the size of her palm and felt cool on her skin. No marks embellished its polished surface.

"How does it operate?" she asked.

"I rub it. Supposedly my finger ridges activate the spells."

Spells indeed. If his fingerprints operated the mechanism, it wouldn't work for her. When she rubbed the disk, nothing happened. "Should I touch it in any pattern?"

"Not that I know of."

"You said before that you calibrated it."

"Actually, Gregor did. He's secretive. He tells me nothing." Wryly he added, "I don't think he understands it, either." He guided Starlight around an outcropping, and the biaquine snorted as if to protest the inconvenience.

"What you said about 'sheets' earlier," Dominick said. "What did you mean?"

Janelle handed him back the disk. "It's kind of abstruse."

"Does that mean you don't know?"

"No," she growled. It was a fair question, though. "Imagine one Riemann sheet as my universe. It has a phase."

"Like the Moon."

"Not that." She paused, thinking. "Do you have clocks here?"

"Well, yes. Certainly."

"Twenty-four hours a day? Twelve and twelve again?"

"Of course."

It relieved her to have that much in common with him. "Think of the phase as time. Say it goes from midnight to noon in my universe." She almost said "like hands on an old-fashioned clock," but then realized analog timepieces might be the norm here.

"And my world is the second clock?" Dominick asked. "Time goes from noon to midnight here?"

"Yes!" It gratified her that he understood so fast.

"The time here and where I found you was the same."

"I know. I don't mean my world and yours are literally related by a twelve-hour difference. Just that they're in some way out of phase with each other, like three in the morning is different than three in the afternoon, even though they're called the same thing."

He was quiet for a while. Then he said, "So the branch cut to your universe is located at a certain phase. It's like saying the gate opens only at a certain time."

"That would be my guess."

"To go around this metaphorical clock and return to the branch cut must take longer than twelve hours. The disk never worked before."

"How long have you been trying?"

"About forty years. Since I was very small."

Forty! That wasn't what she wanted to hear. "Every *day?*"

"Well, no." He sounded embarrassed. "I should. Max does more than I do, and we've both tried more as we've grown old-

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er, with the pressure to settle this matter and produce heirs." He hesitated. "It just all seems so fanciful." Then he added, "Seemed."

She agreed. At least if he didn't always check, he could have missed the gate. She hoped that was why he hadn't found her before this. Or she could be wrong about the whole thing. "I need to read about the theory."

"Such studies are for monks." He sounded surprised.

Janelle had no objection to being considered monkish if it would get her home. What she lacked in savvy about this world she could make up for in her ability to solve problems. "Do you have books about the gates?"

"In my library."

"Maybe I can learn to make one." Or find a more logical explanation for all this.

"If it pleases you to look, you may."

She wondered if reading would be a problem. "But Dominick."

He bent his head, bringing his lips next to her ear. His breath tickled the sensitive skin there. "Hmmm?"

"Oh." She forgot what she had been about to say. His scent surrounded her, a combination of saffron, thyme, and sweat. She was suddenly conscious of how close they were sitting on the biaquine.

He spoke against her ear. "I like your hair. You look like a forest sprite." He brushed his lips across her cheek.

"Stop." She was almost stuttering.

He exhaled. But he lifted his head and straightened up. The night air cooled her cheek.

"What did you want to ask me?" he asked, more formally.

"Your speech." She wasn't certain what unsettled her more, his kiss or that she had liked it. But he was going too fast. "When you speak to your men, you don't use English."

"Yes, I do."

"What do you call what we're speaking?"

"Erst. No one uses it anymore." His voice lightened. "As a youth I complained greatly about having to learn a dead language. I'm glad now I did."

"It's not dead to me." She hoped.

"Then I'm gratified I know it."

"Tell me something," she said. "Why didn't you expect to find me?"

"I guess I assumed that if you existed, it would lead naturally to your coming here. I didn't think it would happen by mistake, *only* because I looked for you."

She rubbed her eyes. "Talk about a self-fulfilling prophecy."

"Apparently so. We will have to marry as soon as possible."

"*What?*" He had just taken "too fast" to "light speed."

"My brother." Dominick paused as Starlight picked his way across a gully that cut across the trail. "If he finds out what happened, he will come to get you."

Janelle's head ached. "Let me see if I have this straight. If you and I marry, you become emperor and he dies. If I marry him, he stays emperor and *you* die. If either of you kills me, he dies."

"Unfortunately, yes."

"If no one marries me, do things stay as they are now?"

"I think so."

"The answer is simple, then. I go home."

"And after that?" he asked. "My men know about you. So will the monks who check your hair. If you are who I believe, how long before Max finds out? If you go home, he might find you someday. I did." Then he added, "That assumes you can go back."

"I have to believe it's possible."

"I understand. But as long you are here, I will risk neither my life nor yours."

Janelle wondered why she couldn't have normal problems, like fixing the plumbing or finding a job. "If we marry, won't your brother die?"

"I don't want his death."

"But you want his title."

"I would be a better emperor."

"Why?"

"Maximillian is brutal man."

"What makes you any different?"

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He gave a terse laugh. "I can think of no one else who would dare ask me such a thing."

Well, tough. "It's a fair question. You two are brothers."

"Your questions are too personal."

She let out an exasperated breath. "You say we have to marry so you stay alive and I don't get brutalized. That's pretty personal."

Silence.

Janelle bit back her impatience. She knew too little about Dominick to judge when to push and when to bide her time. But push she would, if that was what it took to find her way home.

They rode for a while with only the thud of hooves on the trail to break the silence. But eventually he did answer. "My father raised my brother. He ignored me because I wasn't his heir. I spent my childhood with my mother. I had her love. Maximillian had whippings." Tension corded his muscles, and his hold tightened, though she didn't think he realized it. "Father intended to 'shape' Max into a man like himself. He succeeded. Max is exactly like him." Anger honed his voice. "My mother is dead. I couldn't protect her. But I won't let my brother do the same to you."

His words had so many painful implications, she hardly knew what to say. She spoke softly. "I'm sorry."

He clenched the reins so hard, his knuckles whitened. "Max and I were close as boys. He has hardened over the years. I mourn the loss of the brother I loved, but I hate what he has become."

"It must be difficult for you both."

"You are generous, to offer sympathy to those who put you in this situation."

She had no answer for that.

"Janelle." He spoke thoughtfully. "Make a bargain with me."

"How do you mean?" she asked, wary.

"Marry me, and I will do what I can to help you return home. If you get back, who is to say the marriage exists in that universe? You can resume your life without me."

Given her lack of options, he could have demanded she do what he wanted. It mattered that he asked her consent and offered his help. But she knew too little about him. So far he had acted with honor, and a kindness incongruous with his obvious capacity for violence, but she had no guarantee that would continue. Nor did she doubt his offer came with strings; he wasn't talking about a marriage in name only. Her face heated. Yes, she found him attractive. But that wasn't enough. She needed to know him better. To trust him.

"I'm not ready," she said.

"We don't have the luxury of time. This is the best way I know to protect us both."

What to do? Given how little she knew about life here, going it alone didn't seem particularly bright. After a moment, she said, "All right. I accept your bargain."

It wasn't until his rigid hold eased that she realized how much he had stiffened. He said only, "Good," which relieved her. She wasn't ready for any heart-to-heart talks with the fiancé she had just acquired.

They rode higher into the mountains, and the fog thinned until they were traveling under a sky brilliant with stars, far more than she saw in the city of Cambridge where she lived. The day's warmth had fled. When Janelle shivered, Dominick reached to the bags he had slung over the flanks of his biaquine. He folded a sheepskin around her shoulders, with the fleecy side against her skin.

"Thank you," she murmured.

As they rode, Janelle mulled over his words. She couldn't fathom why she would figure in anyone's "prophecy." Her only talents were writing proofs and solving equations. She smiled wryly. Maybe she could subdue the nefarious Maximillian with Bessel functions.

Up ahead, peaks rose out of the fog, dark against the sky. Then she realized it was a cascade of onion-bulb towers, each topped by a spire. Dominick's party approached a cliff that stood about ten feet high—no, not a cliff, a great wall that curved away in either direction, topped by crenellations.

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Eerie whistles broke the night's quiet as the biaquines gathered before the wall, stamping and snorting. A gate swung outward, huge and dark, groaning. Torchlight flickered beyond, where men were cranking giant wheels wound with rope as thick their burly arms. Past the gate lay courtyards, and past them, a huge building surrounded by smaller structures. The layout resembled a European castle, but the architecture evoked the palaces of Moorish Andalusia that Janelle had visited when her family lived in Spain. Icy moonlight edged it all, turning the spires, domes, and delicate arches into frozen lace.

As much as the scene enthralled Janelle, it also bewildered her. Who had settled this land? Dominick's men spoke a dialect of English, but their names sounded Mediterranean, Arabic, or Near Eastern, with English more rarely in the mix. That described their appearance, too. Maybe the Ottoman Empire had spread farther across Europe in this universe. If East and West had blended more, the mix of colonists who settled the New World here could have been different than in her world.

They rode to a courtyard in front of the palace. An immense horseshoe arch framed the entrance of the building like the keyhole for a giant antique key. Its sides rose in pillars, and at the top, an onion-shaped arch curved out and back around to a point. Mosaics tiled the pillars and glistened like silver in the moonlight.

As their party dismounted, stable-hands swirled around them. The biaquines were taller than most horses, but Dominick swung off with little effort. He reached up, offering his arms to Janelle. She hesitated, staring at his harsh features, which were blurred by moonlight and the hint of mist in the air. Then she pulled her leg over and slid down. She ached everywhere. He eased her to the ground, his hold solid after the swaying gait of the biaquine.

The sheepskin had fallen off, and she shivered. Dominick pulled her close, under a jacket he had donned earlier. It was fur lined, not as warm as the skin, but soft and thick against her arms. For just a moment, she gave in to her fatigue and buried her face against his shirt as if that would hide her from his world.

When she looked up again, Dominick brushed her hair back from her face, and calluses on his palm scraped her cheek. She wondered how he had developed them—and then remembered the swords his men wore.

"Welcome to my home," he murmured. Then he bent his head.

Janelle knew what he intended, but she froze, unable to believe he would go through with it. When he kissed her, his lips felt as full as they looked, a sensual contrast to his harsh power. She tensed, but before she could respond, someone behind them coughed.

Dominick raised his head, letting go of her, and she turned around, relieved by the interruption. A lanky man was coming down the steps of the palace, his attempt not to stare at her all the more obvious for its lack of success. He stopped next to them and spoke with Dominick. Although Janelle couldn't catch all of their words, it sounded as if the man was reporting another raid. Dominick and his men had been out searching for the outlaws, intent on stopping the harassment of his people.

Dominick turned to Janelle. "I will see you later." He took off his jacket and wrapped it around her shoulders. His smile was crooked, almost boyish. "It looks much better on you than on me."

"Thank you," she said, uncertain how to act with him.

He climbed the steps with the other man, leaving her with two guards. She noted how easily Dominick assumed authority. He listened carefully and asked questions. When he gave orders, he did it with confidence and tact. She had seen those same qualities in the strongest leaders she had met while her father was the American Ambassador to Spain.

Bracketed by guards, she went up the steps, through a foyer, and into a hall gleaming in the light of torches carried by

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Dominick's men. Janelle's breath caught. Soaring arches filled the immense hall, row after row of them, a forest of pillars in perfect lines. Tessellated mosaics in gold, blue, and green curved around columns and patterned the vaulted ceiling. In each V-shape where the arches met, a stained-glass window glowed with gem colors, showing scenes similar to those of Catholic churches in Spain. It was like an exquisite blending of Moorish art with the styles of a European cathedral.

A group of men met Dominick just inside the entrance. Janelle's guards drew her to a stop. She just waited, too tired to deal with her confusion over what had happened with him in the courtyard. It had to be past two in the morning.

People came and went. It wasn't long before three women appeared, walking through the arches from deeper within the palace. Silk wrapped them from neck to ankle, glistening in the smoky torchlight, crimson and saffron, shot through with gold threads. Their shimmering dark hair fell to their waists.

The trio stopped in front of Janelle. The oldest woman, a matron with silver hair, spoke in melodic phrases that almost sounded like English, but that went by too fast to catch.

"I'm sorry." Janelle's voice rasped with fatigue. "I don't understand."

The woman tried more slowly. "Come with us." She didn't smile. "To someplace you can wash. And sleep."

Relief washed over Janelle. "Thank you."

The woman just barely inclined her head, stiff and cool.

As Janelle set off with them, accompanied by her guards, she glanced back at Dominick. He remained deep in conversation with his men, and she wasn't certain he knew she had left.

The older woman spoke curtly. "His Highness has important matters to attend."

Janelle nodded, not wanting to interrupt his conference. They went down a "corridor" of arches, one of many in the hall, walkways delineated by columns instead of walls. It was dizzying, all that geometrical beauty gleaming in the torchlight.

The older woman was watching her face. "This hall is why Prince Dominick-Michael's home is called the Palaces of Arches."

"It's glorious," Janelle said. "Is this the Hall of Arches?"

"No. The Fourier Hall."

"Fourier?" She blinked. "Like the mathematician?"

The woman gave a sharp wave of her hand. "It has always been called this. That is all I know."

Janelle didn't push. Having lived as the child of a diplomat for so many years had taught her a great deal about dealing with cultures other than her own, and she could tell her interactions here were on shaky ground. She had discovered early on that if she wasn't certain how her words would be received, it was often better to say nothing.

She couldn't stop staring at the arches, though. What an exquisite challenge, to portray those graceful repeating patterns as a periodic function. Their Fourier transform would be a work of art. An unsteady urge to laugh hit her, followed by the desire to sit down and put her head in her hands. Such a strange thought, that she could capture in mathematics the essence of a dream palace that couldn't exist.

The women's slippered feet padded on the tiled floor, and Janelle's tennis shoes squeaked. At the back of the hall, they passed under a huge arch built from gold-veined marble rather than the wood used in the Fourier Hall. A true corridor lay beyond, with stone walls tiled in star mosaics. Its size dwarfed their party, and other halls intersected it at oddly sharp angles. The pillars at corners where the halls met were carved to portray men with great broadswords or women in elegantly draped robes holding long-stemmed flowers. It spoke to the European influence here that the designs included human statues, which weren't seen in Moorish architecture.

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Janelle tried to keep track of their route through the maze of halls, but exhaustion dulled her mind. She was lost by the time they stopped at an oaken door. The guards stayed outside while the women took her into a small room. Plush rugs covered the floor, and mosaics with pink tulips and swirling green stems graced the lower half of the walls. Something odd about the stems tugged at her mind, but she was too tired to puzzle it out. In one corner, a white table supported a blue vase with real flowers. Blue velvet bedcovers lay in another corner, on a thicker pile of rugs, with pillows heaped there like a tumble of rose and jade clouds.

"It's beautiful," Janelle said. "Thank you."

No one answered. They led her across the room and under an archway. In the chamber beyond, a small, sunken pool steamed, and a lamp glowed dimly in a seashell claw on the wall.

The older woman finally spoke. "We can help you bathe."

Janelle's face heated. "It's kind of you to offer. But I can manage."

"Then we will leave you to rest." She was so aloof, she could have been a hundred miles away. The trio bowed and gracefully exited the chamber. A moment later, the outer door creaked on its hinges.

Janelle hoped she hadn't just committed some social blunder. Unsure what she would find, she returned to the bedroom. An oil lamp hung on a scrolled hook by the entrance. It gave less light than the torches, which was probably why the women hadn't carried it, but Janelle preferred the lamp, which neither smoked nor sputtered. To her relief, the door had a lock on this side and opened when she tried it. One of her guards stood a short distance down the hall, severe in his leather armor. Light from a wall sconce glinted on the hilt of the broadsword strapped across on his back.

"Hello," Janelle said.

He turned with a start. Then he said what sounded like, "My greetings, Lady."

"Isn't that sword heavy?" she asked.

He seemed bemused by her attention. "Not for me."

"Oh. Good." She wasn't sure why she asked, but she felt the need to connect to people, to make this less strange. "Goodnight."

His craggy face softened. "Goodnight."

Janelle closed the door and sagged against the wall. She could think of many reasons Dominick might post a guard: to keep her in, as a courtesy, or because she wasn't safe even in his home. For all its extraordinary beauty, his world had a starkness that kept her off balance.

Ill at ease, she explored her suite. In the bathing room, an elegantly carved bench stood against one wall, with a jade-green towel, a silver brush inlaid with mother-of-pearl from abalone, two soaps carved like tulips, and a crimson silk robe. It was all gorgeous, everything handmade. The suite, however, had only the one exit. They had closed her in well.

No one said you couldn't leave, she reminded herself. More than anything, she wanted to clean up. She carried the soaps to the pool, an oval filled with scented water, but then she hesitated. The idea of undressing made her feel vulnerable. The grimy scrapes on her arms and legs decided her; she quickly peeled off her clothes, shivering as the cold air chilled her bare skin. Then she slid into the heated pool.

Warmth seeped blissfully into her body as she lay back. Silence filled the room, a contrast to the muted city roar she had lived with these last years, at MIT. No sirens or engines interrupted the quiet, none of the constant hum that rumbled even in the deepest hours of an urban night. She was immersed in a great ocean of quietude.

Her thoughts drifted to Dominick's gate. A branch cut? They came from complex numbers. She could write such a number as $z = e^{(i\Phi)}$, where Φ was called the phase angle. Varying the phase from $\Phi = 0$ to $\Phi = 2\pi$ was like going around an analog clock from 12 to 12. Just as 12 was the same at the start and finish, so 0 and 2π were the same. However, if she divid-

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ed Φ by 2, then $z = e^{(i\Phi/2)}$. Now the phase was Φ/2 As Φ went from 0 to 2π the phase only changed to π. The angle Φ had to go around a second time before Φ/2 returned to its starting value of 2π. But the same Φ couldn't have two different values of *z*. To avoid that contradiction, *z* slipped through a branch cut to a second sheet for the second cycle Φ. Just as 3 AM and 3 PM were different times, so Φ on each sheet was considered different. Her world was one "clock" and Dominick's was another.

That suggested some sort of phase here had to go through a full cycle before Dominick's gate reopened. Her twelve-hour model was an only analogy; she had no idea how long would she have to wait before the actual gate reopened. Days? Months? *Years?*

Nor was that her only problem. Suppose she divided Φ by 3. The phase would be Φ/3. It meant she would need three "clocks." Three universes. Divide Φ by 4, and she needed four. Many sheets could exist. If she went through a gate, she could end up on yet some other "clock"—some other universe—instead of her own.

Janelle groaned. Her head hurt, and the water had cooled. Putting away her thoughts, she soaped her body and washed her hair. Then she climbed out and dried off with the luxuriant towel. She reached for her wrinkled sundress, but then paused. The robe was far nicer and scented with perfume, certainly more pleasant than her gritty clothes. She slipped on the robe, and the sensuous glide of silk against her bare skin stirred her thoughts of Dominick. She tried to smile at her reflection in the pool. "Hey, Aulair, you look hot." But her voice shook like the ripples flowing over the water.

She padded barefoot into the other room. She was so tired she could barely stand, but she felt too exposed to sleep. The bed consisted of no more than layers of rugs covered by velvet. She sat on it in the corner, with the wall at her back, facing the door as she drew pillows around her. It wasn't until they crumpled in her grip that she realized how tightly she had clenched them.

Her eyelids drooped, and she forced them up. She wouldn't sleep. The lamp swung on its hook, moving shadows on the walls, back and forth, back and forth . . .

The scrape of wood against stone roused Janelle. She lifted her head, disoriented. She had slid down and was lying amid the pillows. The lamp had burned low, leaving the room swathed in velvety shadows.

The scrape came again. She thought she said, *Who is it?* but no words came out.

The door swung inward, moving slowly. Dominick stood in the archway, filling it with his height and his presence. The dim light turned his shirt a darker blue and glinted on the hilt of his sheathed dagger. The way he loomed, his face harsh and starkly intense, evoked the specter of conquerors who swept across continents, laying waste to their enemies.

"Hello." Janelle barely managed the word. Such a quiet greeting for so dramatic a man.

"May I come in?" he asked.

She appreciated that he asked, given that he could have done whatever he wanted. "Yes," she said.

He entered, and the room seemed to shrink. He closed the door, then came over and knelt on the other side of the bed. His shirt was open at the neck, revealing a tuft of chest hair, black and curly.

"Have you slept?" he asked.

"A little." She wondered how the rest of his chest looked.

He watched her watching him, and his lips curved upward. The shadows eased the hard edges of his face. Sitting on the bed, he tugged off one of his boots.

Janelle froze. Now he was taking off the other boot. He set it next to the first and started to undo his shirt.

"Wait." Her cheeks flamed. If she hadn't been so groggy, she would have realized sooner what she might be agreeing to when she invited him into her room.

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Dominick paused. "No?"

"I can't. I mean—that is—"

He waited. Then he asked, "Do you want me to leave?"

"I don't want to be alone. But I don't—" She stuttered to a halt, feeling like an idiot.

"It's all right." He slid across the rugs and stretched out on his side facing her, with his head propped up on one hand. He took up the entire length of the bed. She could see why he might like sleeping on the floor; his legs were too long for a mattress.

"My monks checked your hair," he said. "You are Janelle Aulair."

She flushed, unsettled to have him so near. "Well, I knew that."

He trailed his finger along her hip, sliding up the robe, which suddenly seemed too short. "This is pretty."

She put his hand back on the bedspread. Maybe she should ask him to leave. But she dreaded being alone. He continued to watch her, his head tilted to the side as if she were a puzzle.

"You must have more names than Dominick," she said, flustered.

"Indeed I do. Dominick-Michael Alexander Constantine."

Now *that* was a moniker. "Those names are famous in my universe." She was talking too fast again. "Like Alexander the Great."

"The Great." His gaze turned sleepy, as if he were a satisfied cat. "Tell me more."

"He conquered Persia—" She stopped as he tugged the sash of her robe. His knuckles brushed her inner thigh.

"Don't," Janelle said.

He traced his finger along her cheek. "Do I offend you so much?"

"Sweet heaven, no."

"Good." His voice was like whiskey, dark and potent. "Otherwise, this would be a rather uneventful wedding night."

Whoa. "You have the wedding night before the wedding?"

"If the bride and groom agree, yes."

"What if they don't agree?"

"I thought you did."

There was that. "If you stay tonight, are we, uh, married?"

He watched her face. "If agreement is reached, and the bride receives rings from the groom, then yes. But public ceremonies are traditional and expected, especially for the royal family."

"Oh." She hesitated. "Does that happen tomorrow?"

"In the morning. Is that all right?"

After a moment, she said, "Yes. It's just so strange."

"For me, also." He stroked his knuckles along her thigh. "But not unwelcome."

"Dominick . . ."

He rubbed the hem of her robe between his thumb and finger. "This cloth is beautiful on you." Putting his finger under her chin, he tilted up her face. He kissed her deeply, and she tensed, wanting him both to stop and to keep going. Her only experience with seduction was on the level of sending out for pizza and Cokes; she was so far out of her depth here, she was drowning.

When she didn't protest, he pulled her closer and eased the robe off her shoulders. When he slid his palm over her breast, his calluses scraped her nipple, and she tingled in places he wasn't touching her. Then he drew back, his face unexpectedly tender.

"Women are so small," he said. "Look at this." He put the heel of his hand at the bottom of her rib cage. His palm stretched up her torso and his fingers closed around her breast. "I can hold so much of you, but you couldn't even cover my ribs."

His ribs. Clever, sexy man. Of course she looked at his chest where he had unfastened his shirt. A mat of hair curled over his muscles. She laid her palm against his abdomen, feeling the springy hair, the hard muscles. Very nice. But very intimidating, too.

"You smell like flowers," he said. Laying her on her back, he stretched out on top of her, easing his hips between her thighs. Then he reached for the waistband of his trousers.

"Wait!" Janelle said. He didn't seem to have any speed between *pause* and *fast*

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forward.

He lifted his head, his eyes glossy with arousal. "Wait?"

"No more." She felt like a fool, but she had just discovered she couldn't go this far with someone she barely knew, even if he would be her husband tomorrow.

He brushed his lips across hers. "I won't hurt you."

"Dominick, I—no. No more."

Frustration crept into his voice. "You tease me."

"I don't mean to. I just—I can't."

He lifted his head to look at her. "First your behavior says yes. Then no. Then yes. Then no. Which is it?"

"I'm not ready."

He lay there, propped up on his hands, and she knew they both realized the truth. He could do whatever he wanted and she couldn't stop him. She lay still, meeting his gaze.

Dominick groaned and rolled off her, onto his back. Then he threw his arm over his eyes and inhaled deeply. He stayed there, silent and still, except for the rise and fall of his chest.

Gradually his breathing slowed. Finally he lowered his arm and turned his head to her. "You are an unusual woman."

That was tactful. Better than *Make up your damn mind.* She wanted to hold him, to feel safe, but she wasn't safe with him. Although she didn't think he meant to force her, he would get angry if he thought she was deliberately leading him on, and she could end up with more than she bargained for. She could also, she realized, end up pregnant.

Dominick studied her with that close focus of his. "I don't mean to pressure you." He smiled ruefully. "But you're so lovely, Janelle. Difficult to resist."

Her face heated. "You do sweet-talk a girl." The southern drawl she had lost after her family moved to Washington often slipped back into her voice when she was nervous.

"It may be 'sweet-talk.' But I mean what I say." He took off only his shirt, nothing more. Then he slid down the velvet cover and drew it over them both. Settling on his back, he pulled her into his arms. She closed her eyes, relieved, letting her head rest in the hollow where his arm met his shoulder.

"Dream well," he murmured.

"You too."

Dominick soon fell asleep, his eyes twitching under his lids. As she drifted into slumber, she wondered if he dreamed of the towns and countryside that would someday fall to his army. He could be gentle with her, but she had no doubt he was capable of conquering a continent.

Would he wrack his world with the ambition that led men to create empires—at immense human cost?

IV

The Shattered Hall

Birdsong awoke Janelle. She lay in a pleasant haze, listening to the dawn.

Then she remembered.

Her eyes snapped open. It was real. She was still in the palace. Early morning light filtered through high window slits she hadn't seen last night. The room otherwise looked as she remembered, beautiful and spare. And empty. Dominick had gone.

She rubbed her eyes. Yesterday she had been a new graduate with good prospects; today she had nothing but the unknown. She thought of Rupert Quarterstaff, the lawyer who dealt with her inheritance. Two years ago, when she had been paralyzed by grief, Rupert had stepped her through the estate settlement with a solicitude that went beyond his professional duties. He expected to see her in a few days. What would he do when she didn't show? It would be a mess.

Janelle sat up, rubbing her eyes. She couldn't stay here as the plaything of a warlord who wanted to conquer half of North America. She needed a library. *Someone* had invented Dominick's gate. Pushing off the covers, she shivered in the cold air. She went into the other room and bathed, then dried off with a towel someone had left while she slept. Her clothes

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from yesterday were gone.

As Janelle searched for something to wear, she kept noticing the walls. Something strange . . . ? Stepping closer, she peered at the mosaics. Wavelike curves intertwined in the tulip designs. She hadn't seen them clearly last night because they were the same color as the swirling stems. The curves weren't just wavelike, they *were* sinusoids: diffraction patterns, harmonics, or quantum wave functions, beautiful and elegant. They were too accurate for coincidence; someone had understood them well enough to reproduce the curves. It was another piece of the puzzle, along with the Fourier Hall and Riemann gate.

Deep in thought, she returned to the bedroom. Someone had come in while she bathed; her robe were gone, and the bed had been remade, with fresh rugs and a jade-green bedspread. As she toweled her hair, she surveyed the empty room. She couldn't dress without clothes.

When the doorknob turned, she jumped. She barely had time to wrap herself in the towel before the door opened. The three women from last night stood there, each holding a large box decorated with abalone and opals.

"Uh . . . good morning," Janelle said, clutching the towel around her body.

Her greeting seemed to be the signal they expected. They bowed and entered the room. The older woman took an ornate key off a hook under the lamp and handed it to a soldier outside. He closed the door, and a loud click came from the lock.

Janelle watched them uneasily. "Why did he lock us in?"

"For privacy." The older woman spoke in the same slow voice she had used last night. "I am Farimah." She introduced the younger women as Silvia and Danae.

Janelle was becoming accustomed to the dialect and understood better this morning. It reminded her of times she had spent with the families of dignitaries who visited her father, how she had striven to learn their language. To her, such new words were gems strung together to create sparkling necklaces of meaning.

"What can I do for you?" she asked, awkward in her towel.

Danae offered her box. "It's for your wedding."

Janelle felt the tickling in her throat that came when she was nervous. "Oh. Yes."

"The ceremony will take place immediately," Farimah said. "His Highness has had word that the Emperor's army gathers in the south. Prince Dominick-Michael and his men must leave today to discover what Maximillian plans."

Well, that was romantic; her groom intended to spend his honeymoon spying on his brother. It would give her time to adjust, though, and to learn about the gate.

"We can wait for the ceremony until he returns," Janelle offered.

"He wishes otherwise." Farimah's voice had a definite edge.

"Here, Lady Janelle." Danae opened her box and revealed a treasure, gold hoops and rings, all inset with mother-of-pearl.

"They're stunning," Janelle said. "But I don't wear jewelry."

Farimah stiffened. "Generations of Constantine brides have worn these with pride. You consider yourself above them?"

"No. No, I didn't mean that." Mortified, she tried to repair her faux pas. "I just don't want to presume."

Farimah gave her a look that said plainly, *You do.* But she only said, "His Highness wishes you to have them."

"It's kind of Dominick," Janelle said.

Farimah jerked up her hand as if to strike her. Then she took a deep breath and lowered her arm. Her voice was ice. "You will refer to His Highness as Prince Dominick-Michael."

Janelle wondered if she could say anything right. "I'm sorry. He told me to call him Dominick."

"Ai," Silvia murmured. She glanced at Farimah with sympathy. To Janelle, she said, "Farimah did not know."

Before Janelle could further cram her foot down her throat and tickle her tonsils

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with her toes, Danae intervened by fastening a luminous torque around her neck.

"These jewels will help ensure your safety," Danae said.

Janelle tensed. "My safety from what?"

Silvia clipped a bracelet around Janelle's wrist. "The heirlooms indicate you are wife to the emperor's brother. With so much unrest in the provinces, a woman needs more protection than in normal times."

Janelle liked what she was hearing less and less. Running her fingers over the necklace, she realized it was a delicate version of the heavy chain Dominick wore. The bracelet had the same pattern as the abalone in his shirt cuffs.

While Farimah put a belled chain around each of Janelle's ankles, Silvia took out a blue velvet cloth with gold highlights. Then she waited. Janelle blinked at her.

Farimah sighed as she rose to her feet. "It would be easier to dress you without the towel."

"Oh." Embarrassed, Janelle let the cloth drop to the floor.

"Goodness," Silvia said, as if Janelle had achieved an impressive feat instead of just standing there naked and feeling like an idiot.

"No wonder he wants to marry you so fast," Farimah muttered. "Men see only one thing."

Silvia put the velvet cloth around Janelle's hips. The skirt fit low on her pelvis, showing too much of her abdomen. The hem almost reached her knees, but a slit went up the left side to her hip.

Janelle flushed. "I can't wear this."

"Why?" Farimah asked. "It appears to fit."

"It shows too much skin."

Danae laughed good-naturedly. "What is a wedding for, but to entice the groom?"

"Come now," Farimah said. She knelt by her box and withdrew a girdle designed from beaten coins, with a border of little gold bells. Janelle squinted while they fastened it around her hips. Heavy and snug, the girdle fit over the skirt and sparkled with sapphires and mother-of-pearl. It jangled when she moved. Then Silvia brought out a bra made from silver coins, with loops of abalone and opal beads.

Enough is enough, Janelle thought. "I *can't* wear that."

Silvia considered the halter and then Janelle. "You are right. It is too small."

"I didn't mean my breasts," Janelle muttered. No one listened. Silvia went to the door and knocked. As the guard outside opened it a sliver, Silvia blocked his view of the room. A child squeezed past her, a girl of about three with black curls and a sweet face.

Silvia glanced back at Janelle, her gaze malicious, then slipped outside and closed the door. Janelle stiffened, wondering what she had done to evoke Silvia's hostility.

The child ran to Farimah. "Fami!"

The elderly woman laughed and reached for her. Then she froze, her gaze darting to Janelle. Panic surged over her face.

Puzzled, Janelle gave the child a friendly smile. "Hello."

The girl hid her face in Farimah's skirts.

Farimah lifted the child into her arms, her attention riveted on Janelle. "My apology." She sounded terrified. "I didn't realize she had followed me here."

"It's all right," Janelle said. Both Farimah and Danae had gone deathly pale. *Why?* "She is welcome to stay."

"Thank you." Farimah spoke stiffly.

"She's charming," Janelle said. "What's her name?"

"Selena. Like her mother."

"You seem to know her well."

"She is my granddaughter." Farimah took a breath. "I also care for her siblings. Her mother died in childbirth."

"I'm sorry," Janelle murmured.

The girl was watching her with big, dark eyes that somehow looked familiar. "You mama now?" she asked.

Mama? *Mama?* Ah, hell. Janelle stared at Farimah. "She is Dominick's child?"

Farimah answered tightly. "Yes."

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Life grew messier by the moment. "How many does he have?"

"Five." Farimah was as taut as a coil. "The oldest is twelve."

Janelle wondered when he had planned to tell her. "Are they all your daughter's children?"

"Of course!" Anger flashed in her gaze. "After Selena came into his life, His Highness had no other women."

Janelle rubbed her neck, trying to ease her aching muscles. Selena hardly sounded like a concubine, if Dominick had lived monogamously with her for so many years, raising a family. Had some stupid prophecy kept them from marrying? No wonder Farimah resented her.

Farimah's fear also made sense now. Janelle spoke quietly. "Your grandchildren are welcome in my household."

Farimah just nodded, her posture rigid. But her frozen look thawed a bit. She took the girl to the door and gave her into the keeping of someone outside.

Silvia returned then, watching them with an avid gaze. Janelle wanted to sock her. Silvia could have kept the girl outside and protected Farimah from that heart-stopping moment when the grandmother realized *she* would have to tell Janelle about the children. What had Silvia hoped to achieve? It didn't take a genius to see women had little power here. It created a dynamic foreign to Janelle, an unstated enmity and maneuvering for sexual power. Silvia was a beauty, with glossy black hair and a voluptuous figure. Had she hoped for Dominick's favor? Maybe she believed discord between his new wife and the mother of his former favorite could work to her advantage.

Janelle had no interest in such machinations. Compared to this place, her world was so enlightened it glowed in the dark. She didn't think women here would be burning their bras any time soon. Given the halter Silvia was holding, they would have to *melt* the damn things.

At least this one fit better than the last, though "fit" was a generous description. It held her breasts in a scanty gold mesh with a few jewels in strategic places and more of those bells fringing the bottom. Her groom would certainly have no trouble finding her, given all the noise she would make in this outfit.

"This is the most appallingly prehistoric contraption I have ever seen," Janelle muttered.

Her companions regarded her politely. She didn't think they had understood what she said. Frustrated, she added, "Why are guards outside of my door?"

Danae answered obliquely. "As far as we know, Emperor Maximillian has no idea you are here."

"And if he did?" Janelle asked.

"I would never speak ill of the emperor," Farimah said, "to suggest he might brutalize you out of spite for Prince Dominick-Michael."

Janelle was starting to feel queasy. "Are all women here treated this way?"

"Those with value are protected," Silvia told her.

"I'm afraid to ask what 'value' means."

"I should think it is obvious," Farimah said. "Beauty. Youth. Fertility. Good birth. Gentle nature. Intelligence. You obviously have the first two. Maybe a few of the others." She shrugged. "So if you lack the last, it does not matter."

Ouch. Janelle barely managed to hold back her retort.

They ignored her protests and inflicted make-up on her next. Silvia brushed her hair, working until she had dried and fluffed up the curls. Then they took her into the bathing chamber, where a long mirror hung on the wall. Her reflection stopped her cold. She glistened in gold and sea colors. Her eyes looked larger and greener than normal, and her hair floated around her shoulders like a gold cloud. Even her bangs curled in traitorous perfection. She had to admit, the effect was impressive—and in that it became seductive. They turned her into a woman of mystery and beauty, and it tempted her to believe it increased her worth. That wasn't a path she wanted to go down, one where her intelligence and character had less value

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than her body or fleeting youth.

"That isn't me," Janelle said.

"It will please Prince Dominick-Michael," Silvia answered with strained patience. "That is the purpose, is it not?"

"What about pleasing his bride?" Janelle asked.

Farimah threw up her hands. "You are *marrying* him."

"Only because of a prophecy."

"Yes." Farimah's voice quieted.

They left her then, so she could "prepare" for the ceremony. She had no clue what that entailed, but she suspected she was supposed to think of ways to entice the groom. She smiled wryly. Maybe she should entertain herself by deriving equations for the sinusoids on the walls. That ought to stir up Dominick's libido.

She stepped up on the bench in the bathroom to look out the window—at a spectacular panorama. Mountains towered on both sides, east and west. In the south, before her, they dropped to a mesa several miles distant, where mounted riders moved in chess-like patterns. Dominick's army? It had thousands of men. She hoped that qualified as a large military, one comparable to the emperor's, if Dominick's brother was as bad as everyone implied. Then again, maybe Maximillian was a saint and Dominick just coveted his throne, as disenfranchised brothers had since time immemorial.

Wood grated in the other room. Janelle returned to the bedroom and found a group of strangers waiting for her. Six older women stood in the front, their carriage and jewels surely marking them as noblewomen. Blue silk wraps covered them from neck to ankle, making Janelle even more self-conscious about her skimpy attire. Behind them, an array of servants carried platters of food.

They offered her the feast and waited while she ate. Everyone declined her invitation to join in, but no one seemed offended by the thought. The meal was delicious, though odd, with Janelle standing up, surrounded by silent people, sampling foods and wine. Strong wine. Well, good. Right now, a few shots of whiskey would have done nicely.

When she finished, they took her outside. Twelve warriors waited in the corridor, hulking in armor, with what looked like ceremonial broadswords on their backs, the gilded hilts inlaid with jewels. While the servants took off with the platters, the noblewomen and soldiers escorted Janelle the other way. She went in a daze. She wanted to believe this was a delirium; maybe a car had hit her and she was lying in a hospital. But it felt all too real.

Up ahead, shouts echoed in the halls. It seemed out of place with the reserve of the people here. Apparently she wasn't the only one who thought so; her escorts were slowing down. Those broadswords weren't ceremonial after all, for the men drew the weapons, and the honed blades glittered.

Crashes sounded in the distance. More shouts came, and the halls vibrated with a great pounding. The guards split their group into two, half of the warriors taking the noblewomen one way and the others hurrying Janelle into a side corridor. They ran hard, with drilled precision, while all around them the rumble intensified.

A rangy soldier kept pace with Janelle. "We will go to tunnels under the palace," he said. "They exit into the mountains."

She nodded, rationing her breath.

The rumble surged into a roar—and raiders thundered out of a cross-hall, all astride biaquines. The man in front brought his mount to an abrupt halt, and it reared, its hooves smashing the pillar of an arch that framed the corridor. Dominick's men skidded to a stop, but momentum carried the groups together. Biaquine screams rent the air, and metal rang as swords flashed. Janelle had about as much military knowledge as a toadstool, but it took no expert to see Dominick's men were outnumbered and in trouble. She couldn't understand how outlaws had broken into such a well-defended fortress.

The rangy soldier pulled her into a side

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hall, and they ran hard down the corridor. The bells on her clothes chimed as if announcing their location. Only a few lamps lit the area. Despite the dim light, her guard took the turns with confidence, always choosing hallways too narrow for a biaquine.

Until they hit a dead end.

"Ah, no!" Janelle stopped, heaving in air. They were *trapped.*

"Don't worry." Her guard stepped into a wall recess and pushed the tiles in what looked like a combination.

"What happened back there?" she asked.

"I cannot say. I saw no symbols I recognized on those men." He leaned into the wall and it slid inward, revealing a tunnel. Taking a lamp off a hook in the recess, he motioned her forward.

She entered the passage. "Do you think they came to stop the wedding?"

"I doubt it." He shut the door, closing out the distant clamor. As they headed along the path, he added, "Emperor Maximillian is the person with the most reason to stop it, and those weren't his men. Nor would he raid his brother's home. Even if he were willing to commit such an atrocity, too much chance exists that in the heat of the attack, you would be killed despite his orders. He wouldn't risk it."

Janelle blanched. His answer had an obvious corollary: whoever *was* raiding the palace had no qualms about killing her or anyone else.

They followed an ancient tunnel. Cracks cut through the walls, and lichen encrusted them in eerie patterns. It wouldn't have surprised her to see a wraith coalesce in the recesses where shadows pooled. The damp air smelled musty, and the stone chilled her bare feet. She shivered, wishing she had more clothes.

Then it hit Janelle: not all those marks on the walls were cracks. Wave functions oscillated down here, too, engraved in the stone.

She indicated the patterns. "What are those designs?"

"Artwork," her guard answered. "They're all over the palace." He looked apologetic. "These tunnels aren't kept up well because so few people use them. The levels above are in better repair."

"Ah. I see." In truth, she didn't see at all. The designs looked ancient, which didn't make sense to her.

A murmur of flowing water came from ahead. The path widened into an open area, and a crude rail blocked the way, with walkways curving to either side. She went to the rail and looked down into a well about ten feet across. It plunged into darkness. She toed a pebble over the edge, and a good five seconds passed before she heard a faint splash.

"I'm glad that wasn't one of us," she said. "Pushed by an invader."

The warrior spoke gruffly. "It is a cruel business, this life." He motioned to the walkway on the right. "This should take us to another set of tunnels."

They followed the path—and neither of them saw the break until almost too late. Janelle had already stepped forward when the lamplight revealed the ground had collapsed into the well. She jerked back and stumbled into the guard. Grasping her shoulder with a steadying hand, he held her until she caught her balance.

She stared bleakly at the fissure. It was too large to jump, and the rail that bordered the well was broken. Although two sheets of wood lay across the gap, neither looked solid. Whatever bridge they had once belonged to had fallen into neglect.

Her guard squinted at the boards. "Maybe we can go another way."

They tried the left side, but the fissure extended through that path as well. The tunnel contained nothing they could use to repair the bridge, and the rail around the well consisted of sections too short to bridge the gap.

The chill seeped into Janelle, and the clink of her clothes seemed muted in the damp air. She pried off the bracelets and anklets and hid them in a crack to retrieve later—if she survived to tell anyone. She couldn't remove the girdle because it held

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on her skirt, but at least she didn't jangle as much.

The guard knelt to examine the boards. "I think they can hold you. Perhaps me, but I can't be sure." He looked up at her. "If we go back, you could be killed. Or captured, which could be worse."

"What will happen to you?" she asked.

His gaze never wavered. "I serve Prince Dominick-Michael."

Janelle understood what he didn't say. "To get to me, they would have to kill you."

His face gentled. "Do not look so dismayed. In battle, death is always possible."

Please, God, not today. She knelt next to him. "Can we wait here?"

"I think it unwise. People know of these tunnels." He indicated the shadows beyond the break. "The passages that way will let you escape the palace. You must not be caught. The rest is secondary."

"Your life isn't secondary to me."

His face gentled. "I thank you. But it is my honor to serve Prince Dominick-Michael." He handed her the lamp. "You try first, in case the bridge won't hold me."

"But if you can't cross, you won't have any light."

His grin flashed. "That will make it harder for our enemies to find me, eh?"

It amazed her that he could joke at such a time. She managed a smile for him. "I hope so." She took a deep breath, then turned and stepped onto the bridge. She walked forward, her hand clenched on the lamp, and the span bent under her weight.

Halfway over, one of the boards snapped.

Janelle flailed, dropping the lamp, and it plummeted into the well. As she fell to her knees on the remaining board, darkness closed around her. A splash took away the last hint of light.

"Lady Janelle?" Her guard's voice was rough with concern.

"Here." In a louder voice, she said, "I'm here."

"Blessed Almighty! Are you all right?"

"Almost." She inched forward on her hands and knees. "I'm not to the other side yet."

"You can make it." He sounded as if he was trying to convince himself as much as her.

From your lips to God's ear. She moved another inch and her knuckles hit the jagged, broken edge of the path. Even as relief surged over her, the remaining board creaked. In the same instant that she threw herself forward, the board snapped and dropped out from under her. Her torso landed flat on the path, but her legs hung into the fissure. She scrabbled at the ground, frantic as rocks fragmented under her and clattered away.

With a heave, Janelle hauled herself onto the path and sprawled on her stomach. She groaned as the girdle jabbed her skin.

"Lady!" the guard called.

"I'm here." The pound of her heart felt like storm waves. "The boards fell. You'll have to stay there."

"Ah." He sounded subdued. "You must go on alone, then."

She stood up slowly and swayed, dizzy. When her head cleared, she said, "Will you tell me your name?" She didn't want to leave without even knowing his identity.

"I am Kadar." He paused. "If I do not see you again—I would like to say—" He stopped.

"Yes?" Janelle asked.

"We have heard how you were pulled into our land," he said. "Given all that has happened, you could have hated us and denied our prince. Instead, you treat us with grace. I am just a soldier. I have no great knowledge of other places. But it seems to me that you are a gift to His Highness."

Good Lord. Janelle had thought she mostly stepped on people's toes. She could have done better if she hadn't been so bewildered. But she hadn't thought in terms of hostility. She valued the chance to learn other cultures. Her parents had left her with the treasured memory of

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how they honored the depth and range of the world's peoples. It didn't make her willing to tolerate mistreatment; she had a temper and had always reacted strongly against cruelty or injustice. But according to their ways, Dominick and his people had treated her well.

She spoke quietly. "Thank you, Kadar."

He became all business then, describing the tunnels ahead. Then he said, "The prince has a hunting lodge in the forest. The last passage will let you out near there. I'll meet you at the lodge."

She rubbed the goose bumps on her arms. "Don't you get killed."

His voice lightened. "I shall endeavor not to. Farewell for now."

"Good-bye." Janelle set off, keeping her right palm on the wall for guidance. No light softened the darkness; she couldn't even see her other hand in front of her face. She went with care, probing each step with her foot before she put down her weight, lest she stumble into another chasm. But she didn't dare take too long; she had no idea who else knew about these tunnels or would discover them.

Her palm hit stone. A dead end. Alarm surged through her, but she pushed it down and searched the surface. She did indeed find tiles, as Kadar had described, and she pushed them in the sequence he had given her. When she leaned into the wall, it slid inward with a creaking protest and swung aside. She ventured into the suffocating darkness.

It felt as if she walked for hours. Then she noticed a change; the air had warmed. A scent of pine wafted around her, a welcome change from the stench of musty stone. Even more encouraging, she could see her hand. Up ahead, light sifted through a crevice shaded by fir trees. She was free!

Voices drifted to her from outside.

Janelle stopped and swore silently. The speakers were in front of the opening. She could decipher enough to determine they were sentries for the raiders. Demoralized, she quietly retreated back along the tunnel.

Boots clanked at the exit.

Damn! That had to be the sentries. It was all she could do to keep from running and start her wretched clothes jangling.

After an eon, she reached the place where she had opened the secret door. The sentries were closer. A man swore and another laughed. She slipped past the door, then grabbed its edges and pulled hard. It swung closed with a screech of stone on stone. She barely managed to snatch away her hands before it crashed into place.

A shout came from the other side, muffled by the stone. Then a heavy object slammed the door.

Janelle stumbled forward, raising her hands in the dark. If she retraced her steps, she would end up trapped at the fissure. Kadar had said another path led off from this junction; a true dead end would make the secret entrance too obvious. And indeed, she found a passage that slanted sharply to the right. She followed it, wanting to run but afraid to take the risk. Darkness weighed on her, smothering and dank. She imagined specters at every step, terrors crouched low or clinging to the walls, waiting for her to dislodge them.

Wings brushed her face, and furry bodies. Janelle pressed her fist against her mouth to stop her scream. Then she sagged against the wall and folded her arms across her body while she shook.

Bats. It's only bats. She stretched out her arms and forced herself to go on. Distant crashes rumbled as the sentries beat at the door. No way back existed, only forward into the dark.

Suddenly her palms hit wood: another dead end. She searched the wall, sliding her hands frantically over the rough, splintered surface. Nothing. *Nothing.*

Then she found it, a latch up high. She had to stand on her toes to reach it. As her fingertips scraped several gears, a tiny window creaked open. She peered out—and gratitude flooded over her. The Fourier Hall lay beyond the door.

With light filtering in the window, she managed a better search and found the

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aged gears that locked the door. They crumbled under her touch, as did the lock. She inched the door open and slipped out into the hall of arches. Walking softly through the forest of pillars, she headed for the palace entry. The great double doors were open, revealing an overcast day outside. Freedom.

Hooves clattered behind her.

Janelle whirled around—and barely ducked in time to evade a bareheaded rider leaning down in his saddle to grab her. His biaquine pounded past her under the tall arches.

Janelle sprinted for the entrance, and the rider came around in front of her. As he reined in his mount, it sidestepped toward her. She fled the other way, back through the arches, and tiles shattered behind her as the man pursued. When she swerved into another row of arches, a splintering crack sounded, followed by an oath. Glancing back, she saw an arch collapsing around the rider as his biaquine tried to turn in too confined an area. She kept running.

More shouts rang through the air, and hooves pounded the floor. Riders were pouring into the hall from deeper within the palace and thundering down the columned aisles.

"No!" Janelle skidded to a stop as they came toward her. She reversed direction, but the outlaw chasing her blocked her escape. Desperate, she swung around—to face a second biaquine. It snorted in the confined area, looming above her, its breath hot against her face. Stumbling back, she looked up—and up. She couldn't see the eyes and nose of the man who sat astride the animal; a cougar helmet hid his upper face. But she saw his mouth. The bastard was *laughing*. He urged his mount closer, backing Janelle up against the biaquine of the bareheaded raider behind her.

Chaos filled the hall. Someone screamed, a cry of terror that abruptly broke off. An outlaw goaded his biaquine to rear and its forelegs pawed the air, smashing a pillar and raining broken tiles over the floor. Farther down the hall, another pillar fell in a cloud of dust, and the battle boiled over its remains. The raiders were deliberately ruining the hall, and Janelle could have wept for the destruction of such beauty.

The two outlaws caged her between their mounts. Laughing, the bareheaded man planted his boot between her shoulder blades and shoved her hard into the helmeted man's animal.

"Asshole!" she yelled. The helmeted man grabbed for her, and she socked his arm. Behind her, the other outlaw grabbed a handful of her hair and pulled back her head until she was looking up at him. Exhilaration flushed his face. His yell rang through the clamor, and she thought either he was mad with battle lust or just plain crazy.

Janelle twisted free, but the effort sent her lurching into the other biaquine. It danced to the side and reared, rising far, far too high. Its hooves smashed a column, showering debris. Gasping, shielding her head, she staggered back, too terrified by the enraged animal even to cry out. As it came down, it knocked her over, and she fell to the floor, landing hard on her hands and knees. When it reared again, a scream wrenched out of Janelle.

Scrambling to her feet, she dodged the frenzied animal. The bareheaded outlaw grabbed her, and this time she didn't fight when he hefted her upward. Better to be caught up there than trampled down here. His saddle was narrow enough that he could throw her stomach-down in front of it, her legs hanging down one side of his biaquine and her torso on the other, with the edge of the saddle jutting into her side. He pulled up her skirt and slapped her behind, and she cussed loudly at him. He didn't try to hold her down, though, and she managed to struggle up until she was astride the animal. She nearly fell in the process, but she kept her seat by clinging to the biaquine.

Calls rang through the mayhem, and dust clogged Janelle's nose. The raider kept one arm around her, clenching his

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reins while he snapped a whip against his mount's flank. She recognized Dominick's men among the warriors. The outlaws far outnumbered them, and most were no longer fighting, they were trashing the incomparable Fourier Hall.

Then she saw Dominick.

Towering in leather armor, he rode a massive dark animal. He held his sword high, his face harsh with rage. When he shouted, the marauders surged away from him, toward the palace entrance. The first wave reached the entry and flooded out, and Janelle's captor galloped after them.

In the courtyard outside, the clamor lessened, muted by the open space. Almost no one remained to oppose the invaders. Ahead of them, two men on biaquines were forcing along a limping warrior. With a jolt, Janelle recognized the injured man as one of her guards from this morning. His sword arm hung useless at his side, and blood pumped from a wound in his shoulder.

One of the outlaws raised his sword above the bleeding man. In horrified disbelief, Janelle saw the blade descend, flashing in the chill sunlight. She jerked around so she couldn't see, but nothing could shut out the thud of impact or the hideous gurgle that followed.

"Oh, God," she whispered. She prayed it had happened fast enough to spare him pain. She thought of Kadar and her skin felt clammy. Nausea surged over her.

Her captor galloped with the other men across earthen courtyards toward the huge wall that should have protected the palace. Yells broke out behind them. Looking around, Janelle saw a party of ten men on biaquines racing toward their group.

The outlaws reined in their mounts with sprays of dirt and wheeled to face the palace. The sight chilled her; several hundred raiders confronted the small party of defenders. They would massacre ten adversaries.

Then she saw Dominick—with the *outlaws*. He sat on his huge dark biaquine at the front of the formation, his gaze intent on the ten men from the palace. The defenders slowed as they came closer, near enough for her to see who led them.

Dominick?

Janelle blinked, looking from Dominick with the raiders to Dominick with the defenders. The Dominick in the small party rode Starlight, the big silver biaquine from yesterday. He wore only trousers and a shirt, with a sword on his back as if he had grabbed it when he was too rushed to don his armor.

His party stopped a short distance from the outlaws. Everyone remained silent, watching while Dominick on the dark biaquine cantered out to meet Dominick on the silver biaquine. Janelle understood then. Dominick and his brother were identical twins.

"It's Emperor Maximillian," she said.

"You'd best be silent," her captor answered.

She couldn't fathom how Maximillian could do this to his brother. No wonder the guards had opened the gate. They wouldn't leave the emperor's party milling about outside. They had probably welcomed him, never knowing they were inviting raiders into their midst.

Had Maximillian come to stop the wedding? Supposedly he didn't know. That could mean he also didn't know his men had caught her. Dominick was probably too far away to see her among several hundred riders, particularly since she wasn't the only woman they had taken. But even from here, she could see the fury on his face.

The brothers met in the stretch of dirt between their groups. Their voices carried to Janelle.

"To what purpose?" Dominick was demanding. "Do you take joy in killing? Hurting innocent people? Destroying beauty?"

Maximillian lifted his hand, and one of his men rode forward with a rough leather bag that bulged. At the emperor's signal, the man opened the bag and dumped its contents. Something large fell to the ground and rolled toward Dominick.

A bloody head.

"No," Janelle whispered.

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Frozen silence followed the gruesome offering. Then Maximillian said, "Think on this, brother. Next time you send a spy to my army, my response won't be so gentle." His voice hardened. "You were lucky today. We could have killed your servants and burnt your home to the ground."

Dominick bit out his words. "You've spied on me for years."

Maximillian lifted the reins. "If I ordered an attack now, who would stop me? The major portion of your army has been practicing maneuvers. Even riding hard, they won't be here for fifteen minutes. Be wise, Dominick. Fight me and I will retaliate. Is that what you want? No! Leave this land. Go across the sea. Anywhere." He regarded his brother steadily. "Because if you stay, someday I will have to take your life."

Then the emperor turned and cantered toward his men.

Dominick reached over his shoulder for his sword. Janelle felt her captor go for his own weapon, and all around her, other raiders were doing the same. When Maximillian saw his men drawing steel, he reined in his biaquine. But he didn't turn to Dominick. He sat in his saddle as if daring his brother to charge and kill him from behind.

Dominick let go of his sword and lowered his arm.

"No!" A woman cried out from within the raiding party. "Prince Dom—" Her voice cut off.

Dominick scanned the riders, his strained expression clear even at this distance. Janelle doubted he could tell who shouted; even from within the group, Janelle couldn't locate her. The raiders had taken at least fifteen women, probably more. If she called to warn him that his bride was among the captives, she would also be warning his brother.

Then she thought of a way to let him know without revealing herself. She was apparently one of the few people he let use his single name. "Dominick!" she shouted. "Here—"

The raider clamped his hand over her mouth. "*Quiet.*"

Janelle clawed at his hand, and he pinned her arms to her sides. Although Dominick looked in their direction, she didn't think he saw her. She struggled to free herself.

"If you make trouble," her captor said, "it will anger the emperor. If he becomes angry, he will retaliate against his brother. And you. He knows this palace. He gave it to Prince Dominick-Michael. He could destroy everyone here. Is that what you want?"

She went still, then shook her head.

Dominick was watching his brother. "Max."

The emperor brought his biaquine around to face him. "We will let the women go when we finish with them."

"This isn't done," Dominick said. "You went too far."

"You have my warning," Maximillian told him. "I give it for our mother's sake, in her memory. But it is the last I will give you."

With that, the emperor wheeled around and set off at a gallop. His men went with him, stirring up a great cloud of dust, pounding out the great gate and away from the palace of shattered arches.

V

Maximillian

The raiders followed a trail that switchbacked across the face of a cliff. They rode on the edge of the world, a sheer wall of stone to their left and an abyss of astonishingly clear air to the right, with endless, verdant mountains far below. The line of biaquines clung to the cliff like a fragile string that could snap any time.

Janelle saw why Dominick had avoided this route. The path was barely wide enough for one biaquine, with nothing to catch anyone who stepped off the trail. It was also obvious why Maximillian used it; the trail offered a faster path to the flatlands, insurance against Dominick's pursuit when his army arrived to defend their liege.

She shivered as her reaction to the raid set in. She had never witnessed anyone die

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before, let alone in such violence. Even with so little knowledge of Othman, she could tell Dominick wasn't ready to take on Maximillian. The ramifications went much further than a violent argument between brothers. Would the people here tolerate a challenge to their emperor? She didn't doubt Dominick would come for the women of his household, but she had no idea how far he would go to rescue them or what he would do when he discovered she was gone.

They kept a grueling pace, and around noon they reached a meadow at the foot of the mountain. The grasses and wildflowers had been trampled earlier, probably by the passage of this same party. Cliffs rose starkly behind them, and hilly fields stretched to the south, swirled by yellow and blue blossoms.

The emperor finally called a halt. With a sigh, Janelle's captor reined in his mount. He slid his arms around her waist and leaned against her. "Maybe we can get to know each other better now, little bride. You were wanting a man tonight, eh?"

She pulled away from him. "Don't touch me."

He yanked back her head and pressed his lips and teeth against her neck. But when she twisted away, he didn't wrestle her back. Instead he froze—and released her as if she had a plague. No one paid them any heed; the other men were dismounting, checking biaquines, taking out trail rations. An older man with a gray beard rode through the group, stopping to confer with various people.

Still behind her on the biaquine, Janelle's captor spoke sharply. "What is your name?"

"Salima." She even managed to keep the tremor out of her voice.

"You're lying."

She had no chance to answer, for the bearded man had reached them. "How goes it, Aker?" he asked her captor.

"Fair enough," Aker said, his voice cautious.

The other man indicated Janelle. "You can have a few minutes with her. But be ready to ride when the call comes. Maximillian wants to leave the women here, so they don't slow us down."

Aker answered in an oddly subdued voice. "I think His Highness will want to take this one."

Ah, hell. Janelle spoke fast, grabbing her thought from before, doing her best to use their dialect. "I'm sick. I'll give a killing fever to anyone who touches me."

The bearded man cocked an eyebrow. "You don't look sick to me." His gaze traveled slowly over her. "Far from it."

"I'm in the early stages. The most contagious time."

He snorted. "Which is why you were married today, eh?"

"She's fine," Aker said with a laugh. "You should have seen her in the palace. She can scream like a banshee."

Screw you, Janelle thought.

"I will tell the emperor of your offer," the bearded man told him. Then he continued on to a cluster of other riders.

Aker dismounted and helped Janelle down, but he otherwise went out of his way to avoid touching her. She didn't know whether to be relieved or even more afraid.

The bearded man soon reappeared on foot—accompanied by Maximillian. Janelle's pulse lurched. The emperor could have been Dominick; he had the same eyes, the same strong features, the same height. But unlike Dominick, who warmed with his gaze, Maximillian's stare was ice. He appraised her as if she were an object for sale.

The emperor glanced at the bearded man. "You didn't exaggerate. She's lovely. Exotic, with that yellow hair. Yes, we will keep the bride." He nodded to Aker. "I will remember your generosity."

"Your Highness." Aker sounded strained. "Look at her jewels."

Puzzlement creased Maximillian's face. He pushed Janelle's hair over her shoulder to see her necklace better. For a long moment he stared at it. When he spoke, his voice was too quiet, like the calm in the center of a storm. "Are you my brother's

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wife?"

Janelle met his gaze. "Yes." She prayed he didn't find out they had never finished the ceremony.

"It *cannot* be. Dominick would never risk his own death to marry some pretty tidbit." He took her chin and turned her face to the side. "My God, you do look like her. But you're too young." His voice hardened. "From where do you come?"

"Cambridge." She had no idea if it existed here. "Near Boston."

"Boston? Where is that?"

"Dominick called it 'another sheet.'"

His posture went rigid. "And your name is Salima?"

She didn't see any point in lying now. "No. It's Janelle."

"Hai," Aker murmured.

Maximillian swore. "That's impossible."

The bearded man spoke. "If she is the one, Your Highness, you have her now instead of your brother."

Maximillian answered with barely controlled fury. "One day earlier. *One day,* and I would have been in time." He reached toward Janelle. When she backed away, Aker stepped behind her and grasped her upper arms, holding her in place.

The emperor grabbed strands of Janelle's hair and yanked them out, making her gasp at the stab of pain. He thrust the tendrils at the bearded man. "Ride to the palace. *Fast.* Have her signature checked. And tell Major Artos to prepare the army. Dominick will soon realize she is gone, if he hasn't already."

Maximillian turned back to Janelle. "You," he said grimly, "will come with me."

The emperor's company rode hard during the day, with stops only to change and rest the biaquines. They continued into the night, lighting their way with torches. Maximillian had Janelle sit in front of him on his biaquine. At least he changed his saddle to an animal skin with fleece against her legs. Smells saturated her senses: leather, sweat, musky animals. Maximillian's armor jabbed her back and his thighs pressed against her hips. Her chafed skin burned.

"You know Dominick has five children," Maximillian said when they slowed to rest the horses. "He loved their mother. He hasn't touched another woman since. If it wasn't for that godforsaken prophecy, he wouldn't touch you, either."

If he expected to get a rise out of her, he would be disappointed. When she didn't respond, he spoke tightly. "Dominick will be uncle to your children. Not father."

She made herself stop gritting her teeth. "How noble of you, to rape your brother's wife."

He leaned near her ear. "You will regret that."

It no longer surprised her that his men had inflicted such cruelty at the palace. A leader's personality was reflected in those who followed him. Yet she also saw Dominick in the emperor; they moved alike, gestured alike, spoke alike. Maximillian led his men with the same natural authority and intelligence, and he obviously had their respect. Both he and Dominick exuded an ingrained arrogance, though in Dominick it was softened by a sense of humor that suggested he took himself less seriously than his brother.

Some time after the Moon began its descent, an officer rode up alongside them, a husky man with well-kept armor. "A messenger has arrived, Your Highness, from the scouts you left to watch the palace."

Maximillian didn't look surprised. "Has Dominick come, then?"

"I cannot say. Shall I bring the messenger?"

"Immediately."

As the rider fell back, Janelle's mood lifted like a tentative bird uncertain whether or not to take flight. Although it seemed unlikely Dominick had already gathered sufficient forces to come after Maximillian, she could hope.

The officer soon reappeared, accompanied by a red-haired man on a biaquine. Janelle could better tell the difference now between Maximillian's soldiers and the

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outlaws he had hired to augment his company. This man had the scuffed armor worn by the raiders.

"What is your message?" Maximillian asked.

"It's the bride." The redheaded man nodded toward Janelle. "The wedding never took place."

Janelle silently swore.

Behind her, Maximillian tensed. "She has his jewels."

"They reversed the ceremonies," the man said. "He gave her the jewels this morning."

Maximillian took Janelle's shoulders and turned her until she could look up at him. "Then you are not yet his."

She met his gaze. "Dominick and I are married."

"My messenger says otherwise." He glanced at his officer. "Go get Brother Anthony."

"But you must have a proper ceremony," the officer protested. "One fit for an emperor. That takes time."

"And give Dominick time to rescue her?" Maximillian said. "I think not. Get Anthony. *Now.*"

Brother Anthony turned out to be another warrior. He rode with Maximillian, and the emperor's aides surrounded them, all on biaquines. The torches cast stark shadows, leaving the faces of the riders half in darkness and half lit by wavering orange light. Anthony wore an unadorned cross, but Janelle couldn't tell if he was a monk, a priest, or a cleric that didn't exist in her universe. She just wished she were somewhere else. Anywhere. Like on the Moon.

Fleeing the specter of Dominick's pursuit, Maximillian didn't even stop for his own wedding. He let them slow enough so Anthony could speak, and then they held the ceremony on the run, as the army rumbled across the plains.

"Each day the Sun rises," Anthony droned. "Each night the Moon graces the sky in one of its myriad phases, during the ices of winter and the droughts of summer. In the joy of spring or the fertility of autumn, so shall you cleave to each other." He glanced at the emperor. "Maximillian Titus Constantine, do you accept this woman, Janelle Aulair, as your wife?"

"Yes," Maximillian said.

"No," Janelle said.

"No one asked you," Maximillian told her.

"The hell with this," she said. "I'm married to Dominick."

Anthony cleared his throat awkwardly. He produced a scroll and handed it to Maximillian. "I've already signed it."

Alarm surged in Janelle. "That's *it?*"

"It is done," Maximillian said. "You are Empress of Othman." His voice cut like steel. "And you will learn to respect me, wife, or you will find out just how thoroughly that title can be a curse."

VI
The Fire Palace

The stars glittered as soulless witnesses to the passage of the army. Here in the plains, the night never cooled; even hours past midnight, the air felt like a steam bath. Lines of riders bearing torches wound across the land in rivers of fire.

Janelle dozed, leaning against Maximillian. When she opened her eyes, bleary and confused, the sky had turned crimson. Silhouetted against the horizon, a palace dominated the view. It dwarfed Dominick's home. The central onion dome was surrounded by smaller domes that clustered like great water droplets, gold-plated and glistening. Bridges arched from tower to tower, glowing in the dawn as if they were flames. The palace shimmered in the morning's fire.

"Do you like it?" Maximillian asked.

"It's spectacular," she admitted.

"It is my home." He sounded tired but satisfied. "And now yours."

The stairway wound around the tower, circling a central shaft of air. Janelle could see over the railing all the way to the bottom, many stories below. They climbed single-file: two guards, Janelle, Maximil-

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lian, and two more guards. She could barely walk, she hurt so much from the ride. Only the unwelcome prospect of being carried kept her from collapsing. Maximillian was a foreboding presence at her back, threatening in his silence and unstated intent.

At least he had no time for her now. The moment they arrived, people had sought to see him: officers, clerks, servants, aides. His advisors were at the bottom of the tower, sorting out what needed to be done, but he obviously had to return to his duties.

Their climb ended at a landing with a heavy wooden door. One of the guards lifted its iron bar and pulled the handle. With a creak of protest, the door swung ponderously open.

They took Janelle into a circular stone cell with a high ceiling and four small windows, one each looking north, south, east, and west. A wheel across the chamber was wound with a thick chain, which then snaked up the wall and across the domed ceiling to its highest point, held in place by iron rings. From the top of dome, it hung halfway to the ground. A pair of leather shackles dangled from its end.

Two guards went to the wheel, and one tapped a combination into some mechanism there. Leaning their weight into their work, they cranked out the chain. It rattled up along the wall, pulled by its own weight as the shackles descended. A stench of oil permeated the air. The guards let the chain down to Janelle's height and locked it in place. Another guard pushed her forward, and she stumbled into the shackles, which swung away, then came back and thwacked her shoulder. The entire time, Maximillian watched with an avid gaze.

While Maximillian watched, two guards came up on either side of Janelle, towering over her. They stank like sweat and biaquines. They lifted her arms, and they tightened their hold when she tried to pull away. Then they shackled her wrists above her head.

"*Why?*" she asked Maximillian. "I've done nothing to you."

"Nothing?" he said, incredulous. "You've torn apart my life and destroyed my bond with my brother. That prophecy has brought us nothing but endless grief."

"That may be true. But I have nothing to do with it."

"Of course you do. You *are* it."

"I'm here *only* because Dominick looked for me. If Gregor had never said anything, you would have never known I existed." She suspected Maximillian and Dominick would have been antagonists anyway; they were too much alike, two conquerors in a land that had space only for one.

"You would have come anyway," he said. "When you were seventy."

Janelle doubted it. By that time, he and Dominick would be close to ninety, if they lived that long. Age added a great deal to a person, maybe the serenity of a long life or a cynicism steeped in discord, but whatever happened, surely they wouldn't still be locked in this duel of fates half a century from now. Far more likely, Gregor or the "seeress" had misread whatever evoked this miserable prophecy.

The guards at the wheel cranked out the chain, and the shackles rose until they pulled Janelle's arms tight over her head. She had so far hidden her distress, but as the chain continued to rise, lifting her into the air, it was too much. She groaned, and a tear ran down her face. When they finally locked the chain in place, she hung painfully by her wrists in the center of the cell.

Maximillian came over and stood eye-to-eye with her. "My brother thought he could take my title and my life. He will pay for that." He lifted his riding quirt in front of her. "I shall send him this. Soaked with your blood."

She wanted to spit at him. "I don't care how great your title. What you're doing is sick."

Janelle expected him to deny it. But he only said, "A man in my position can never show weakness." Fatigue saturated his voice, revealing far more pain than he

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probably realized. "For our entire lives, Dominick and I have been pitted against each other. He must learn I will never tolerate his betrayals. It is true, you will pay the price. But that is the way of life."

She regarded him steadily. "He would never do this."

He answered bitterly. "Dominick and his 'moral imperatives.' It is easy for him to preach when he has never had to serve as emperor. He grew up flawed by a mother's softness, and now he presumes to suggest I lack a conscience. But inside, he is just like me."

"If he chooses compassion over cruelty, so can you."

"You confuse weakness with compassion."

Her anger sparked. "Brutality is easy. It takes no strength."

A muscle twitched under his eye, and his voice hardened. "I will see you tonight." He went to a small table by the door and set down his whip so she would be staring at it. Then he regarded her with an unyielding gaze. "While you are waiting, my empress, it would behoove you to think long and hard about how you speak to me."

Sweat gathered on Janelle's forehead. She was having trouble breathing, and her wrists burned from supporting her weight. "You can't leave me like this."

"Why not?"

"I'll suffocate." She strove to keep the fear out of her voice. "If I die, so do you, according to the prophecy."

He raised an eyebrow, but he didn't refute her statement.

"At least give me the combination to release that wheel with the chain." She suspected he would refuse even if he thought she had a good point, to assert his control, but he might let a guard bring her down if he could do it in the guise of denying her request. After all, the guards already knew the combination. And the emperor would want her in good enough shape for whatever he intended later.

Maximillian didn't take the bait, though. Instead he smiled with condescension. "You couldn't figure out the combination even if I gave you the key."

She scowled at him. "Why not?"

"You may be well apportioned in certain aspects." He looked over her body, while her face heated. Then he said, "But I hardly imagine abstract thought is one of them."

She had to make a conscious effort to hold back the retort that hovered on her lips. His attitude gave her another idea, though. If he thought she was stupid, he might respond just to taunt her.

"As long as this key doesn't involve math," she said, trying to look blank.

"What, you don't like numbers?"

She grimaced with distaste. "They don't like me."

"Very well." His laugh grated. "The combination that releases the chain is the same as the number of terminal zeros in 4089 factorial."

What the blazes? She understood what he meant, but it astounded her that he offered such a game of number theory. It wasn't something most people knew even in her own universe.

"You do know what a factorial is?" he said.

"No," she lied.

"Pity. Not that it would help you. You could never multiply all those numbers together." With that, he motioned to his men. They strode from the cell, and the door slammed shut, the rumble of its closing vibrating through her prison.

Janelle closed her eyes, demoralized. Then she steeled herself. She had to escape. She didn't know what to think about this "key." Of course he thought she couldn't solve the problem; to calculate 4089 factorial she had to multiply the first 4089 natural numbers together. No way could she do it in her head. Except . . . she didn't need the entire number to determine how many zeros it ended in; she needed only to know how many factors of five it contained. Every five, when multiplied by an even number, added a terminal zero. It was simple. She had done such problems in middle school.

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Janelle concentrated. Dividing 4089 by 5 gave 817 plus a remainder she discarded. She divided by 5^2, 5^3, 5^4, and 5^5 and added the results. The first time she calculated 1018. So 4089 factorial ended in 1018 zeros—if she hadn't made a mistake. She redid it and got 1019. Again, for 1017. It took six tries to convince herself 1019 was the answer. All that time, the pain in her arms and shoulders worsened.

"Now what?" she muttered. She stared at the table where the whip lay, along with several spiked implements she neither recognized nor wanted to. Flinching, she wondered if she would pass out when Maximillian went to work on her. It would be *hours* until night—

No. It wouldn't be that long. She gritted her teeth. He had left her this way because he wanted her to dwell on it. So she would think about something else. She craned her neck to look around the cell. If she swung like a pendulum, she might reach the walls and catch the chain where it stretched up the stone. From there, she could stretch her leg down to the wheel.

She kicked her legs to start swinging, which worked, but it also made her spin. Her clothes chimed, creating far too much noise. The chain twisted until it could wind no tighter and then unwound, faster and faster. When it finished, it twisted the other way. It was agonizing on her wrists, and bile rose in her throat. As she came to a rest, she closed her eyes and breathed slowly until her nausea receded.

Then she tried again. This time she controlled her swings better. The chain still twisted, but less than before. She finally managed a big enough arc to hook her foot on the chain where it snaked up the wall. She jerked to a stop—and her foot slipped. With a groan of frustration, she swung away, across the chamber.

Janelle slowed to a stop and hung there, breathing hard. She strained to hear if anyone was outside, but no sound penetrated the thick walls. That worked in her favor; she doubted anyone could hear her bells ring, either. The Sun was low in the sky, shining through a window, and she closed her eyes against the glare. She cursed at Maximillian's image in her mind—yet it was the same as the man who had treated her so well the night before. No, it wasn't the same. She would never confuse the cruel lines etched into Maximillian's visage with Dominick's starkly handsome face.

Wetness ran down her arm. Looking up, she saw blood ooze out from under one shackle. *Deal with it,* she thought, and kicked her legs to swing again.

On her fifth try, she caught the chain and wedged her foot between it and the wall so she didn't swing away. Straining, she stretched her other leg to the wheel. Her big toe barely scraped the lock, which consisted of five horizontal levers. She had no idea how the levers corresponded to 1019, if they did at all. For lack of a better idea, she assigned the digits 0 through 9 to the five levers, two for each. Then she pressed out 1019 with her big toe. Each time she pushed a lever, it snapped back up into place.

Nothing.

Gritting her teeth, she reassigned the numbers and tried again. No success. Her third attempt fared no better.

Janelle blew out a gust of air. Holding herself by the chain on the wall eased the strain on her wrists, but her foot ached and her leg was shaking. She scraped the levers with her toe and noticed they tilted backward as well as forward. Maybe that was how they accounted for ten digits. She assigned 0 through 9 to all the positions, forward and backward, and retried the pattern.

Nothing.

Sweat ran into her eyes. Maximillian had probably made up the damn combination. She couldn't quit, though. She switched numbers and pressed the combination—

The lock snapped open.

With a squeal of metal, the wheel jerked and the chain slid up the wall, rattling against the stone. Janelle's foot slipped and she swung into the center of the cell, all the time dropping as the chain played out. Her feet smacked the ground

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and her arms slammed down in front of her. As she sprawled onto her stomach, the clang of the chain hitting the floor rang through the chamber.

For a moment she lay, stunned. Then she sat up, shaking, praying no one had heard. Euphoria swept over her, followed by an urge to cry, then to laugh. No time to hesitate. She pried at the lock on one shackle, but it didn't budge. With her muscles protesting, she climbed to her feet and limped to the table, dragging the chain. A belt studded with metal spikes lay near the whip. She blanched, hoping she never found out why Maximillian had left it there. She had her own use for it, though. She worked a spike into the shackle, and kept at it until, with a loud snap, the lock clicked open.

As Janelle took off the shackle, blood oozed over her wrist. Ignoring the queasy lurch of her stomach, she went to work on her other wrist. As soon as she was free, she dropped the chain and ran to the closest window. Rising on her toes, she peered through the pane. It looked north, over the plains where Maximillian's forces had camped, thousands of men and biaquines, more even than she had seen in Dominick's army. They must have been coming in all day. If she climbed out on this side, anyone down there could see her.

The east window also faced the army. The south overlooked a garden with a fountain. Two women sat on a bench, chatting and eating fruit. The west window faced another tower, and the palace spread out below in a jumble of yards and crooked alleys. She pressed close to the glass and squinted down at her tower. She was in its dome, which curved out and down from the window to a ledge that circled the widest point of the onion. The ledge didn't look sturdy, but she saw no better options.

The window, however, wouldn't open. Janelle ran to the table and lugged it across the chamber, her sore arms protesting. She swung it hard at the glass, and the pane shattered under the impact, shards flying into the air. She knocked off the jagged pieces with one of the table legs, acutely aware Maximillian might return any moment. Then she set the table under the window and climbed through the opening, careful of the broken glass around the edges. Finally she was outside, sitting on the slanting dome, balanced high above the world. Wind blew back her hair, and for a heart-stopping instant she felt certain it would knock her off her precarious perch and send her plummeting to the ground far below.

Breathe, she thought. She waited until her pulse slowed. Still sitting, she inched down the bulb, using friction from her soles to control her descent. She started to slide anyway, until she feared she would hit the ledge and flip into the air. She dragged her palms on the surface, and it burned her skin, but it slowed her descent. With a jolt, her feet smacked the ledge, and she crouched down, fighting for balance. Her heart was beating so hard, she could feel it pumping.

A breeze clinked the bells on her girdle. She held her breath until they quieted and her pulse calmed. Then she inched along the ledge toward a bridge of scrolled grillwork that arched from this dome to the next. Far below, an alley squeezed between the towers.

After what felt like eons, she reached the bridge and climbed onto it, keeping low behind its grill. Then she crouched down, absorbing that she hadn't fallen to her death. *And now?* She was trapped in a place full of people with no reason to help her and plenty not to. If she reentered the palace, she could be caught. She peered between the scrolled bars of the bridge. The small courtyard below contained no people, only a cart piled with rugs. No ladders descended any wall she could see, but a flimsy trellis with vines and red flowers stretched up the other tower.

Don't look down. She checked the doors at both ends of the span, but neither opened from the outside. Finally she clambered over the bridge above the trellis. Gripping the iron, she lowered herself un-

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til she was hanging from the bottom of the grillwork. Her feet scraped the trellis. She concentrated on finding a foothold and tried to ignore the trembling of her aching arms. But she had hung too long in the cell; her arms gave away and she lost her grip.

With a gasp, Janelle fell down the trellis. She managed to grab the framework and yank to a shoulder-wrenching stop. Immediately she thrust her feet between the slats, taking the weight off her arms, and then she clung there, gulping in air as if it were a rarity she might never again experience. But she couldn't stop. Clenching her teeth, she resumed her descent. She closed her eyes, narrowing her world to the lowering of her body inch by inch. She waited for the trellis to break, for someone to discover her, for that shout of recognition—

Her foot touched the ground.

Janelle collapsed against the wall. But she had no time to rest; voices were coming from the alley that curved around the tower. She darted into a recessed doorway and knelt in a deep pool of shadow created by the building.

Two men entered the yard carrying boxes. From their conversation, it sounded like they were taking supplies to the monastery. They loaded the cart promptly, with no fuss, and returned to the palace.

Janelle ran to the cart and climbed in the back. She had no wish to end up at a monastery supported by Maximillian, but this might at least get her out of the palace. Working fast, she hollowed out a cavity under the rugs, then squeezed in and hauled the rugs over her body, arranging them as much like before as she could manage. Several sack of some goods and a crate poked into her cramped hideaway under the rugs. Weighed down by carpets, buried in the sweltering heat, she waited.

The darkness grew close, and the odor of dyed cloth was smothering. Any moment Maximillian would discover her escape and search the area. If this cart hadn't left by then, she would be in serious trouble. She had been a fool to hide here. She should have snuck into the palace, found some clothes, and pretended to be a servant.

A shout came from the courtyard, and her pulse leapt. Another shout—and with relief, she realized one of the monks was telling the other to hurry up.

The cart jolted into motion. She held her breath, though she knew, logically, they couldn't hear her through piles of rugs. A different voice called out, and the cart stopped while conversation trickled into her hiding place. Did Maximillian know she was gone? *Let it be something else.* Anything. Maybe a sentry had to check their identification.

The rickety cart started again. Its wheels creaked, planks groaned, and the rugs whispered against each other.

After a while, she breathed more easily. She parted the rugs a bit, to make a spyhole. They were rolling through the encamped army. It seemed to go on forever, soldiers everywhere, with biaquines, oxen, supplies, and the many helpers who tended to the needs of a military force. Gradually the sea of people thinned out. She couldn't see much through the hole, only that they were headed toward the mountains.

Janelle lay still, wrestling with her thoughts. She felt as if she were part of a jigsaw puzzle. A prophecy pulled a mathematician from one universe to another; a gate relied on an abstract concept somehow turned into reality; a fabulous hall was named after a mathematician. Dominick understood abstruse theoretical concepts with little background, and his twin also had an unusual knowledge of math. *Why?* She could see the pieces, but not the overall picture.

Her stomach growled, a reminder she had eaten nothing since last night, when Maximillian shared his trail rations. Taking care to be quiet, she checked the goods crammed tight around her, several sacks and a crate. The sacks held grain. It tasted awful, and she disliked taking supplies

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from monks, but she liked the prospect of starving even less.

Then she hit gold. Or, more accurately, wine; the crate held ten bottles. It took a while to dig out the cork in one, but she managed. She drank in gulps, soothing her parched throat. By the time she finished half the bottle, she felt amazingly content. She had escaped Max the Nightmare, and she could almost forget she had no refuge.

The pain in her wrists was harder to ignore, and she feared the lacerations would become infected. Then it hit her: she had an antiseptic. Shifting her weight, she poured wine over the cuts. It stung like the blazes, but she was so tipsy it dulled the pain. She opened a second bottle as a reward for her efforts, and soon after she started it, she fell asleep.

Fire licked her wrists. Flames, heat, burning, burning, *burning*...

Janelle opened her eyes, passing from sleep to waking without the usual moment of pleasant nothing. The agony in her wrists made that impossible. Tears wet her cheeks. Her spy-hole revealed that night folded over the land with only a flickering glow to light the way, probably from a lamp near the driver.

With clumsy hands, she cleaned the cuts on her wrists again. Then she ripped strips of cloth off one of the sacks and bandaged her wounds as well as she could manage. She drank more wine to ease the pain. Eventually she dozed, floating in a sea of flame.

Birdsong woke her. Bleary-eyed and hung-over, she peered through her hole and saw dawn lightening the world. The pain had receded, and she dozed more easily this time. Around noon, she roused enough to change her bandages. Dried blood caked the cloth, but the scabs were clean, without infection.

Sometime in the afternoon, the cart rattled up to a building of dark red stone that could be the monastery. Square towers rose at its corners. Voices rumbled nearby, and she glimpsed two men walking from the cart to the building.

With caution, she widened her spy-hole. The cart stood in a yard paved with stones and mud. Mountains rose behind the building, sharp in the sky, rough-hewn sentinels not yet softened by erosion. Moving stiffly from her cramped sleep, she squeezed out of the cart and eased down by its large wheel. Her head swam, but even as she sagged against the side, voices came from the left side of the building.

She took off in a limping run, and dodged onto a narrow path between the right wall of the monastery and a muddy hillside. Her vision blurred, but she kept going, holding her bells against her body and praying no one heard the infernal clinking of those she couldn't reach.

Janelle wasn't sure what to do. She could ask for sanctuary, but she questioned whether anyone would honor that request. She doubted they wanted to provoke Maximillian, particularly in the matter of this odious prophecy.

She came out behind the monastery. The roughly mortared wall in the back had two entrances, each a wooden door with iron braces. The first opened on a storeroom stacked with crates, which didn't bode well if the monks were about to unload the cart. She went back outside and ran to the second door. It opened into a foyer, with a staircase to the right. After easing the door closed, she limped up the stairs. At the landing, they turned right, and sunlight slanted through a round window high on the outer wall. She looked out onto a walled quadrangle in the center of the building, a yard open to the sky. The three men crossing it didn't fit her image of monks; instead of robes, they wore trousers, work boots, and simple shirts.

She continued up to another landing, this one with a door. When she leaned against the portal, she heard nothing. She edged it open, and a long hall stretched before her. She limped to the first door and listened; voices rumbled in the room beyond. At the next one, silence greeted her. Holding her breath, she opened the door.

A library. An *empty* library.

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Janelle slipped inside and locked the door with a large key she found on a hook inside. Then she took stock of her refuge. A table occupied the center of the room, old and exquisitely carved with vines. But what compelled her were the *books*. They filled shelves on every wall. The only open space was a panel across the room, where a cushioned banquette stood below a window. She hurried to the window and looked out. The quadrangle lay below, empty now except for vegetable plots and apple trees.

With a sigh, she sank onto the bench. The worn look of this place suggested either the monks had forgone material wealth or else they had poor support. She fingered the coins on her girdle. Would it backfire if she offered them payment to send for Dominick? With all the gems and precious metals she was wearing, she might have some bargaining power. Then again, Maximillian would probably reward anyone who returned his wife, and she doubted her bangles had much value compared to his wealth. Nor were her jewels likely to tempt people if they feared helping her would earn them the type of punishment the emperor had threatened her with in the tower.

Janelle raked her hand through her hair. She needed to know more about this world. She went to a shelf and pulled out a book at random. The text had an odd title: *Elektron Motion: Antique Editions, Monografs of Rekord. Elektronik form: Alhambra Graphiks.*

The date was 1546 A.D.

She squinted at the cover. If dates were the same here as in her world, this book was centuries old. Elektronik form? From *1546 A.D.?* The title implied it was a collector's monograph, an "antique" created from an electronic publication. Given everything she had seen, that level of technology five hundred years ago made as much sense as cave men with cell phones.

Then again, these people could step between universes.

She flipped through the book. A preserving finish protected its pages. Reading wasn't as difficult as she expected, despite the odd spellings; physics was physics regardless of language. The first chapter dealt with electronics and the second with an electron gas. A chapter on electrochemistry followed, then one on quantized energy levels of an atom. Unlike texts in her world, which treated the topics as different subjects, here they were lumped into one text on "elektron motion."

She replaced the book and took another. Even older than the last, from 1489 A.D., it discussed heat flow. Although the models differed from those in her world, they gave the same results: heat came from molecular motion and was a form of energy.

Eager now, she pulled out a fat tome titled *Dynamical Analysis.* The first half focused on her specialty, differential equations, and the rest applied their solutions to problems in classical motion and semiclassical models of molecular behavior. Other books followed the same form, opening with chapters on theory, followed by applications. A book on genetics described how biaquines had been bioengineered from horses for strength, speed, and the ability to fight.

Then she found a treatise on tensor analysis.

By themselves, tensors were just arrays of numbers. Nothing unusual. But they appeared extensively in certain sciences, including general relativity. Einstein's bailiwick. Einstein had believed it was impossible to travel faster than light, a result that would limit the ability of humans to leave the solar system. This theory closely resembled his work, with one difference—its author assumed faster-than-light travel existed. A chill ran through Janelle. This read like a historical text, one written *after* the advent of such travel.

She began a methodical search then. And she found what she sought. Titled, simply, *Advanced Formulations,* it covered wormholes, space warps, and complex speeds that circumvented the singularity at light speed. One chapter presented resolutions to the paradoxes for

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superluminal travel, including a discussion of alternate spaces and times. It proposed a "Riemann screen" that could offer views of those other continuums. Then she understood; the "Jade Pool" of the prophecy was a viewing portal into alternate universes.

The final chapter detailed the design of a starship drive.

Janelle sat at the table, surrounded by books, too stunned to read any more. If this record was accurate, these people had achieved interstellar travel *five centuries ago.* What the blazes had happened since then?

Footsteps sounded outside.

Janelle froze. A door opened nearby, then closed. She glanced around quickly, but saw nowhere to hide. As the doorknob to the library turned, she jumped to her feet, and her clothes jangled.

The footsteps receded.

Janelle went to the door and leaned against it, straining to hear what was happening outside.

More footsteps.

She backed up until the table stopped her retreat. A key clinked in the lock. *No.* To have come this far, to have made this incredible discovery, only to be caught—*no, not now.*

The door opened.

VII
Prophesier

A slender man stood in the archway. Wrinkles surrounded his eyes, and he wore his gray hair long, in a queue. His clothes were simple, brown trousers and an unadorned gray shirt. For a long moment he stared at Janelle. Then he stepped inside and closed the door.

"This is an odd place for a bride," he said.

She folded her arms over her skimpy clothing. "I need to contact my husband."

"I've seen that girdle," he said coldly. "The emperor's aunt wore it at her wedding. So will the bride of the emperor's brother."

"Yes, I'm Prince Dominick-Michael's wife." In truth, she had no idea who she was married to, but she wasn't about to tell him that. "I need to send him a message."

He spoke dryly. "My apology if this is too blunt—but why are you in a monastery, alone, on your wedding day?"

"It's not my wedding day."

"Why else would you dress that way?"

"The wedding already took place."

"Who hurt your wrists?"

Startled, she covered one of the bandages with her hand. "I must go to Dominick."

He lifted his chin. "This monastery serves the emperor. We will send for him."

"No! You can't do that."

"We are loyal servants to Maximillian." He made no attempt to hide his suspicion. "If his brother needs to be contacted, the emperor will do so."

"I can offer you a reward." Inspiration came to her. "One worth far more to you than jewels or gold." She indicated the books on the table. "I can tell you what these mean. It could improve your lives beyond imagining." Whether she could actually do that was debatable, but she had no doubt she could offer him more than he had now, if the level of understanding she had seen accurately portrayed how little the people here retained of their ancient knowledge.

"That is hard to believe," the monk said.

"But true."

His voice hardened. "Prince Dominick-Michael would never marry any woman except the one from the prophecy. And, Lady Janelle, the emperor would do anything to prevent that marriage."

She stiffened. "You seem to have decided who I am. You have me at a disadvantage."

"I am Gregor."

Her anger surged. "*You* made that ghastly prophecy." She waved at the library. "You figured out enough here to look across space and time, right? But you don't really understand it, do you? Otherwise, you could have told them more, like how it works."

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Anger tightened his expression. "I have spent my entire life studying these books. I understand them better than anyone else alive."

She plunged ahead, ad-libbing. "That's why I'm the prophecy." For all she knew, it was true. It was no stranger than anything else that had happened. "I was sent to you, Brother Gregor. Would you like to know more? Give me sanctuary and I'll tell you."

"You think I would betray Othman in my own lust for knowledge?"

"A love of knowledge is a gift, not an undesirable lust."

He scowled at her. "You talk a great deal."

"Think what you could learn. You're a brilliant scholar; you must be, to have tamed space and time." She didn't know him, but if he understood even a small part of these books with no formal training, it could be true. "I can help unlock these mysteries for you."

"You speak *blasphemy.*" He cut the air with a sharp wave of his hand. "Such study is for men, and only those who dedicate their lives to the monastery, forgoing riches, prestige, *and* women."

"A lot of these books have female authors."

He glared at her. "That may be. But living women aren't allowed in here." His gaze traveled over her body, and he made a visible effort to pull his attention back to her face. "You will not seduce me into betraying the emperor."

"What betrayal?" She clenched her fists, ignoring the pain in her wrists. "You think it's all right for Maximillian to kidnap his brother's wife, but heaven forbid she should protect herself?"

"I don't claim Maximillian is a gentle man." He stepped back to the door and pulled a cord hanging there. "But he is my master and I am sworn to obey his word and law."

Janelle swallowed. "What does the cord do?" When he didn't answer, her anger surged. "Was it a game, pitting Maximillian and Dominick against each other from the day of their birth?"

"No." Fatigue showed on his lined face. "It threatens all I value. The well-being of Othman."

"And you think that depends on me going to Maximillian?"

"He is the emperor." Gregor pulled himself up straighter. "It is my moral duty to act in his best interest."

She made an incredulous noise. "How can you talk about moral duty when you intend to send me to be raped and tortured by a monster?"

"I hardly think you are fit to pass judgment on an emperor."

"Why not? I know brutality when I see it."

Gregor shifted his weight. "How he treats you and how he rules Othman are different matters."

"Like hell."

"At your age and with your female attractions—" He cleared his throat. "You don't have what it takes to make such judgments."

"I may be young," she said, "but that doesn't mean my brain doesn't work. And what does you finding me sexually attractive have to do with my ability to think?"

His face turned a deep red. "You twist my words."

"No, I don't." Frustrated, she said, "You make it sound as if I'm evil because I don't want to go back to a man who plans to thrash me until my blood soaks his whip, after which he's going to send it to my husband."

"I have to do what I believe is right. I cannot sacrifice higher principles for your welfare."

She regarded him steadily. "I question the validity of your principles."

His face turned red. "If my principles weren't *valid,* it wouldn't have mattered to me whether or not you had reason to remain in your cold, soulless universe. You had no one there. Nothing to stop you from leaving."

"What?" Janelle whispered. He couldn't mean what she thought.

His voice quieted. "I saw them die. The

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nobleman in Andalusia. His lady. Their son." Softly, he added, "Your family. I'm sorry."

The air seemed to rush out of the room. At first she could say no more than, "He wasn't a nobleman." Then she inhaled deeply. "They were making bridges among different peoples. They *died* for it. How can you call that soulless?"

He shook his head. "Right or wrong, they left you alone."

Footsteps sounded in the hall. Four men entered the room, all dressed like Gregor. Turning to them, he indicated Janelle. "We have a guest. We must send word to the emperor."

The monks gave Janelle a cloth she could use as a shawl to cover herself, though she suspected they did it more for their own peace of mind than for her. They locked her in a high corner room, provided water and a basin, and brought her fruit, cheeses, and a carafe of wine. Then they left her alone.

As demoralized as she felt, she was ravenous. She wolfed down the food, then washed up and searched her cell. Shaped like a piece of pie, it measured five paces by three at the wide end. The walls were whitewashed plaster. A bench stood against the outer wall, and above it, light trickled in a window slit. Swirls on the cloudy glass reminded her of the Mandelbrot fractal. Had Dominick's ancestors learned chaos theory? *What secrets were locked in that library?*

She was still reeling from what Gregor had told her. He saw her family die. It was apparently part of what convinced him she was destined to come here. She knew he couldn't have affected what happened through the Riemann screen, that he might not have even seen their actual deaths, only that horrific news clip of the car exploding. But nothing would stop the pain that flooded her.

Janelle rapped the walls; she prodded, scraped, pushed, and yanked anything she could reach. She pounded the window, trying to break the glass, even knowing she couldn't wriggle out the narrow opening. It offered a view of the yard that fronted the monastery—and so she saw when the riders left, galloping down the same trail the cart had taken up here. She thought of Maximillian, and bile rose in her throat.

Eventually, she sank onto the floor in one corner and pulled her knees to her chest. Laying her head on her knees, she closed her eyes and gave in to her exhaustion.

Janelle awoke with sunlight slanting across her face. A clamor outside had roused her: men calling, biaquines trumpeting, boots stamping. Muzzy with sleep, she climbed onto the bench and peered out the window. Warriors filled the slice of the yard she could see, men in armor on biaquines.

And Maximillian.

Her panic flared. He strode across her field of view, his black armor absorbing the sunlight, his dark hair whipping around his face.

"No!" She scraped at the window, trying to dig out the glass. Only a sliver of stone crumbled under her assault. She kept going, frantic, knowing it would take hours to dislodge the window, that she wouldn't fit through the opening anyway. But she couldn't quit. She remembered the shackles, the whip and spiked belt, and the ugly hunger in Maximillian's gaze.

A key turned in the lock.

Janelle spun around. Jumping off the bench, she pulled the shawl around her body, as if that could shield her.

The door opened, revealing Gregor. Maximillian towered in the shadows behind him, the hilt of his sword jutting above his shoulder.

Gregor stared at her, his face unreadable. He stepped aside and bowed deeply to the emperor. Then he left, his footfalls receding down the hall. Maximillian remained, his unsmiling gaze fixed on Janelle. With a slow tread, he walked into the cell—

And it wasn't him.

"Dominick!" Janelle flung herself across

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the room, and he caught her in an embrace. She wrapped her arms around him and laid her head on his chest, closing her eyes while tears squeezed out under her lids.

"Ai," he murmured, stroking her hair. "I wasn't sure what to expect. I feared hatred."

"I don't hate you." Her voice caught. "I hate what you've done to my life."

He drew back to look at her. Then he touched her bandaged wrists. "I swear my brother will never hurt you again. *Never.*"

She felt dizzy with the release of fear. "Gregor told me he was sending for Maximillian."

"Whatever you said convinced him to seek me instead. His men found my army en route to Max's palace." Unexpectedly, he laughed. "You have sorely traumatized our Brother Gregor. He informs me that you are a most disturbing woman. He says he does not envy my marital state."

She managed a smile. "Trauma builds character."

"So it does." His amusement faded. "I will leave my Sixth Regiment here. You and I can ride home with the rest of my army."

From what Janelle had gathered, only twenty men lived at the monastery, scholars rather than warriors. "Do you really need so many to counter a few monks?"

"Not counter. Protect. In summoning me, they have risked Maximillian's wrath." He held out his hand. "Come with me, Janelle."

She took his hand.

VIII
The Key

The library in Dominick's palace awed Janelle. She wandered through room after room with bookcases built into the walls from the floor to the vaulted ceiling. Sliding ladders gave access to the upper shelves. Engravings in the wood curved in vine motifs, and marble panels bore quotes from scholars she didn't recognize. Gold and burgundy brocade upholstered the armchairs. Tall lamps stood in the corners, flickering with flames behind their stained glass shades. Most of all, books filled the rooms, embossed, gilt-edged, gleaming everywhere in the golden light.

Janelle's bodyguards stayed back, giving her a semblance of privacy. She had barely spoken to Dominick during the ride here from the monastery today. She needed time to sort out her thoughts. Nor did she know what to say; they had so little in common, and she felt far out of her league with him. Yet he stayed on her mind. It was more than the physical attraction; he also intrigued and compelled her. But she wasn't ready for this man who would be emperor.

Perhaps he understood. He hadn't insisted on accompanying her here. He had to know she was avoiding him; what happy bride immediately sought out a library upon arriving at her new home? Then again, most brides hadn't just discovered such a momentous trove of knowledge. Although Dominick seemed puzzled by her excitement, he didn't resist her pursuit of the knowledge.

Judged from the most modern scrolls in this library, the year here corresponded to that in her universe. However, just as in Gregor's library, the science collection had no recent books. The tomes were centuries old, the most recent dated 1557 A.D. A layer of dust covered them. She found no history of science, no explanation of how these people had once possessed such great knowledge and now had so little.

In fact, she found few histories of any kind, though she searched for an hour. Several works described the reign of Dominick's family, but they didn't go back to the sixteenth century. Although it was harder to read the historical accounts, they clearly focused on wars and politics, what the authors considered great deeds of the Constantines. Yet she found many hints that his ancestors had also distinguished themselves in scholarly pursuits, showing that same gift for abstract thought she had seen in Dominick and Maximillian.

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One section of the library dealt with architecture, including books about the Palace of Arches. Nothing explained the Fourier Hall, but a few studies mentioned a "key" to that great room. She eventually found a description in a book on ancient military codes, of all places. Settling into an armchair, she pored over the text, puzzling out the words. The arches of that gorgeous hall formed a code. Their Fourier transform was a key. But to *what?*

Janelle sat back, thinking. In two dimensions, the transform would probably be a peak with rippled tails; in three dimensions, it might resemble the diffraction pattern for a circular aperture. The locations of the central peak would specify a time. For what? The text seemed to describe a portal, not the gate that had brought her here but something for a much bigger event.

She went to a desk and rummaged in its drawers until she found an inkbottle, quill, and parchment. It took her a while to figure out how to use the quill, but finally she set to work, trying to derive the Fourier transform of the arches. She couldn't do it exactly; that would require a computer. But the book gave drawings and measurements for the hall, and she could model the arches as the sum of a few squared *sine* waves.

As she ground away at the equations, the lamp behind the desk burned low. The transform had the shape she expected, with a large peak at the number 2057. Why 2057? She thought it represented a time. Perhaps it meant 2057 years in the future or that many years since something had happened. Or the year 2057.

A chill went through her. In 2057, she would be seventy-one, about the age of the woman in the prophecy. This *couldn't* connect to her—for that implied she would still be here in fifty years.

Dismayed, she went on another search—and hit gold: a modern account of the Jade Pool. The "jade-hued surface" had to be a Riemann screen. The author considered it an enigmatic artifact of mythical proportions and presented equations for it as if they were runes of a spell. Janelle could appreciate what Gregor had achieved, if he had unraveled practical knowledge from such fanciful treatments.

The book also discussed Riemann gates, which turned out to be a more complicated application of the screen. She didn't understand the technology, but she worked through the equations. No matter how many times she tried to find a mistake in her work, she derived the same result: the gate didn't depend on two sheets—it involved *hundreds.* Dominick had managed to go back and forth to her universe because he used the same gate, but it was closed now, and the entire cycle would have to complete before it reopened. That would take centuries, maybe even millennia.

She stared at the parchment with its blotted ink. Then she folded her arms on the desk and put her head on her forearms.

Sometime later, a man said, "Janelle?" A hand rested on her arm.

She lifted her head to find Dominick watching her. He had pulled a stool up to the desk and was sitting next to her.

"What happened?" he asked.

She shook her head, too disheartened to answer.

"Tell me," he said softly.

"I don't think I can go home." The words burned inside her. "If you hadn't opened the gate when you did, you could never have found me. I would have been long dead before the cycle returned to my universe."

"You are telling me the prophecy created itself? That if Gregor had never said anything, you wouldn't be here?"

She could only say, "Yes."

He answered in a low voice. "Then I am doubly sorry."

"Something happens in fifty years," she said unevenly. "When I'm the age of the woman Gregor saw in the pool. Another gate is going to open. A big one. During those few months, your people may be able to do something incredible."

He seemed bewildered. "What some-

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thing?"

"I don't know." She hesitated. "Maybe your ancestors didn't strand you forever. Maybe you can find them." She laid her palm against his chest. "Your family had the gifts to understand once."

A strange look came into his eyes. "There is a saying." He spoke in an unfamiliar language.

"What does it mean?"

"Roughly translated: Constantines are the key to the future."

She stared at him. "Who else besides you and the monks has a library like this, with the ancient books?"

"Just Maximillian."

"My God," she whispered. "It's *you*. Your family. *You're* the key. The Fourier Hall is a clue, or a remnant, like the waveforms on the walls, but you're the guardians of the knowledge. It's probably why your family ended up ruling Othman." She motioned at the library. "Everything you've lost is still here. The ability to unlock it is *in* you, in your genes, your minds. If you can find it." She felt as if she were breaking. "But why me? How could you reach across universes for someone to help you do this?"

He spoke in a subdued voice. "Gregor said the pool showed many futures. My father wanted the one that maximized his empire. I always assumed it depended on who ruled, Max or me, and that you came into it because you brought power into our family, probably through an alliance." Quietly he said, "Maybe it is much larger than this battle between brothers. Perhaps it is something only you can do."

A tear slid down her face. "At what price to me?"

"Ai, Janelle." He put his arms around her shoulders and drew her to him. "I don't know how to take you home. But if you let me, I will give you a home here worth having."

She laid her head against him and fought back her tears.

Dominick's suite was far different than the chamber where Janelle had spent her first night in the palace. It was five times the size. Low, black-lacquered tables stood around the room, surrounded by big cushions instead of chairs. Rich tapestries in gold, red, and green hung on the walls. The rugs he used for a bed filled one corner, tumbled with velvet pillows. Braziers burned in other corners, and oil lamps flickered in wall sconces, shedding a dim golden light. It all had a barbaric elegance.

Janelle sat with Dominick on his bed, leaning against the wall. They had come here from the library, and now he held her. She fitted to his side, unable to talk, her thoughts edged with pain.

After a while, she said, "It is hard to believe you are brothers."

He answered in a low voice. "Do not see me with blinders. What Max does and believes—it is in me also. I had a different life, and it taught me other ways. Had brutality molded me instead, I would be just like him."

"Will you go to war?"

"He is my brother, despite everything." He sounded tired. "But I will not desert my home and people to go 'across the sea,' as he says I must. If that means we must fight, so be it."

She understood. Six of his officers had died in the raid on the palace. He could rebuild the hall, but nothing would bring back those men. At least Kadar, the guard who had helped her in the tunnels, had survived. He had been injured, but he was recovering.

"Gregor told me about your family," Dominick said. "I'm sorry."

She couldn't talk about it. So she said only, "My father was an ambassador. Do you have them here?"

"Yes. It is a position of honor, usually held by a nobleman." He rubbed his hand along her upper arm. "The people of Othman have a history of strife with the Andalusian Empire. We descend from their colonies, but we gained our independence centuries ago."

Andalusia. Southern Spain. "The empire doesn't exist in my universe. But Spain is a nation. I lived there for years."

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He didn't seem surprised. "It is no wonder the prophecy predicted you would affect our balance of power. Your background suits you well to the throne."

Dryly she said, "I don't think your brother was interested in my background."

The corded muscles in his arm tensed. "Max will never be satisfied until he takes you from me or kills us both." Grimly he added, "He will succeed with neither."

"He says he and I are married."

Ire sparked in his voice. "He cannot marry my wife."

"His spy told him you and I never wed."

"I gave you the jewels. And we consummated the marriage. So we are wed."

"Uh, Dominick." She lifted her head. "We didn't consummate it."

"I stayed the night. As far as anyone knows, we did." He cleared his throat. "Unless you plan to say otherwise."

She smiled. "I won't."

He looked relieved. "Good."

"I met your daughter. She's charming."

His tone gentled. "Yes. All my children are."

"I'm sorry . . . about their mother."

"Ah, well." He sounded muted. "It has been years."

He fell silent after that, and she regretted bringing up the memories. After a while, she said, "What happened to your people five hundred years ago? Was there a war? A catastrophe?"

"I don't think so." For one of the few times since she had met him, he sounded uncertain. "Some of the people just left."

"To where?"

Dominick pointed upward. "There. Somewhere." He pushed his hand through his hair. "I have more education than most because my mother insisted Max and I study history, language, astronomy, and mathematics when we were boys, as much as anyone could teach us. But it barely touches what is my library. Why did our ancestors desert this world and never come back?" He shook his head. "We have lost that knowledge. They took so much with them. Legend says they left us behind deliberately. Some claim a political rift existed between those who went and those who stayed. Others say we remained of our own free will, as guardians of Earth, and that those who left cannot return because they became lost between worlds, even universes." Softly he said, "Perhaps it is both. But it's been half a millennium. Our memories are faded."

It was heartbreaking to think of the human race fractured that way. "Maybe they'll return someday."

"You will search for answers?"

She nodded, gratified he didn't object. "Gladly."

"You say I have some small talent for scholarly pursuits." He sounded bemused.

"More than small, I think."

"I haven't the interest, though." His smile flashed. "But ah, Janelle, our children will be brilliant."

It hurt to realize her children would never know her world. Yet it was true; if they inherited their parents' ability for abstract thought, and learned to use it, they might truly reach for the stars. She would teach them what she knew. But most of all, she would love them, as her parents had loved her.

He was watching her face. "Together, you and I can achieve much."

"I hope so." Her voice caught. "We will make a good place." Somehow.

"Aye," Dominick murmured. "We will."

Janelle didn't know if she would ever understand this complicated man, but she wanted to try. She knew life here wouldn't be easy. It was a violent world, harsh and unyielding, and Maximillian would always be there. Yet it also had an incredible beauty. If she could never go home, she could at least have her work in the library, a family to love, and dreams of the day when humanity might soar beyond the bounds of Earth.

A bittersweet peace settled over her. This wasn't a life she would have chosen. But it might hold joy, even astonishing events, and for that, she could look forward to the future. ■

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Science Fact

Project Boreas: A Base at the Martian North Pole

Stephen Baxter

One of my many hats, in this case a space cadet peaked cap, is that of a Fellow of the venerable British Interplanetary Society. From June 2004 to February 2007, I worked with the BIS on a design study of a manned base at the Martian north pole. For definiteness we imagined a five (Earth) year stay, from 2037 to 2042. This is in a long tradition of similar studies by the BIS, which produced a design for a lunar lander as early as 1939, and for an interstellar probe in 1978. It is a weighty study; project leader Charles Cockell is a professor of astrobiology at the Open University.

I worked on history, culture, glaciology, and climatology, and was also in charge of the sheep dip (old Monty Python joke). It did me good, I think, to work in a team for a change, and to do something resembling real science. The results of our work have been published as *Project Boreas: A Station for the Martian Geographic North Pole*, ed. Charles S. Cockell (British Interplanetary Society, 2006) (and Arthur C. Clarke and I are planning some scenes set at the pole of Mars in our next *Time Odyssey* collaboration [*Firstborn*, Gollancz and Del Rey]).

As a place to live, the Martian north pole is a pretty good approximation of a torture chamber. So why send humans there? For the thrill of it, and for the science, some of which only humans are going to be able to do in the near future—in particular ice cores, which are crucially important. In 2000, the First International Conference on Mars Polar Science and Exploration concluded that "the principal goal of Mars polar research is to determine whether there is an interpretable record of climatic and geologic history that has been preserved in the [layered] polar deposits." And for the foreseeable, it's going to take a human presence to extract an ice core from Mars.

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It's the science I want to concentrate on in this piece. But what kind of place is the Martian north pole?

Overwintering on Mars

It's cold and it's dark. Mars has the same sort of axial tilt as Earth, so just as on Earth, the north pole enjoys half a Martian year of perpetual daylight, and then half a year of darkness—that is, about a full Earth year of night. What's worse, for a good chunk of time even Earth is below the horizon.

As for the weather, Mars is a bit like high-altitude terrestrial deserts: when the sun goes down, it gets cold fast. At the pole, as soon as the sun disappears at the autumn equinox, a "snow" of carbon dioxide ice nucleated on dust and water-ice crystals starts to fall. But Mars's atmosphere is mostly CO_2: thus on Mars, in the winter, the *air* snows out. It lasts all winter. Ultimately you get a dry ice layer one to two meters thick, and throughout the winter there is a steady low-speed wind into the polar regions to replenish the lost air. It's no fun to live under this; it's not like a blizzard, more a permanently smoggy sky, so in the polar dark you can't even see the stars.

In all, fully one-third of the atmosphere freezes out each winter. Imagine that happening on Earth!

In the spring the sun's heat sublimates away the carbon dioxide, leaving behind a residue of water ice with dust and other contaminants, thus adding a layer to a permanent water-ice cap.

In Project Boreas, we explored the challenges of living at the Martian pole. Although British comic-book hero Dan Dare (in a 1951 *Eagle* story) once holidayed at the Hotel Mars-Astoria, "one of the glass-domed airtight winter-sports hotels at the north pole of Mars," sadly we found it would be a sort of multiplication of the usual difficulties of life on another world, the confinement and the limited resources, with the unique challenges of polar exploration on Earth. You would face months of darkness stuck in a dome on a featureless white surface, an environment like a sensory deprivation tank. Life would be still more constrained by planetary protection protocols, keeping any Martian life insulated from the terrestrial and vice versa, which would complicate the simplest operation.

And despite Dan Dare, you couldn't even ski, incidentally. The ice is too cold to allow the melting of a lubricating layer under your skis, as on Earth. It would be like skiing on concrete.

So why would you go there? Perhaps for the resources. In the first realistic study of how to send humans to Mars, the *Mars Project* of 1953, Wernher von Braun proposed landing winged ships on one of the polar ice caps, chosen for their smoothness: the 125-tonne "landing boats" needed runways. In the 1990s, NASA scientist and SF writer Geoffrey A. Landis proposed a first landing at a Martian pole for ease of access to water in the surface ice; temperate-zone landings would have followed later because there you would have to drill for your water. We're certainly going to be studying ISRU (in-situ resource usage) techniques at the pole. For if you can live off the land on a Martian ice cap, there's a good chance you could make it on the surface of any ice moon, from Ganymede on out.

And there's good science to be done. In this way, Project Boreas is a logical culmination of four centuries of exploration since 1666, when, just 56 years after Galileo first observed Mars telescopically, Giovanni Cassini first spotted white polar caps on the planet.

Weather and Ice on Mars

Project Boreas will give us a chance to establish "ground truth" validation of the theories we have been building up on Mars's climate and glaciology since Cassini, from orbiters and rovers and observation from Earth.

The permanent ice cap itself is a thing of wonder, with features unlike anything on Earth. From space it looks like an ice cream hurricane, with the ice cut through

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by "spiral canyons," thought to be formed by a combination of ice flow and wind effects (like ice caps on Earth, the Martian cap has a parabolic profile, more evidence for ice flow). Through steady sublimation and deposition, the canyons migrate with time, and as the planet's axis nods, the cap expands and contracts. The polar cap is a self-organizing system a thousand kilometers across, a frozen storm that spirals with the centuries and breathes with the millennia.

Our astronauts will have a chance to examine all this in detail. We'll drive down the spiral canyons and sample the exposed strata in their walls. The cap's internal structure, to be detected by seismology and radar studies, is complicated, containing layers of carbon dioxide ice or clathrates, and up to 50% trapped material, including dust, volcanic ash, impact fallout, evaporites from past seas and lakes, and perhaps even biological traces. Even the ice cap surface itself has a complex structure, with features without terrestrial analogs, such as "cryptic" areas of dark albedo (carbon dioxide ice?) and "cold spots" (where carbon dioxide is being depleted from the atmosphere?).

We know the ice is flowing, but the detailed physics is unknown because we don't know precisely what Martian ice contains. Even if we did know, field studies would be essential. On Earth extrapolation from laboratory simulations to the low strain rates found in the field is problematic, a difficulty orders of magnitude more challenging on cold, low-gravity Mars, where deformation rates are very low.

We'll also be looking for evidence of liquid water, which could harbor life. There could be basal melting. A flaw in the cap called the Chasma Boreale perhaps results from a catastrophic outflow of basal water. Even on the surface, liquid water could be found. We'll look for evidence like meltwater features, ice fogs, volatile anomalies. And we'll look for microscale near-surface environments, droplets trapped under bits of rock: the crew will perform a "fingertip search."

As for the weather, the poles are at the heart of the planetary carbon dioxide cycle, through its snowing-out through the winter in each hemisphere. This cycle is coupled to the dust and water cycles, and to atmospheric heat transport. The poles are therefore pivotal to the global climatic system. And so catching a Martian snowflake in a spacesuit hand will teach planetary lessons, for it is a remarkable fact that Mars's global cycles of dust, carbon dioxide, and water all intersect in the formation of each flake.

We will be monitoring the polar climate at multiple locations for extended periods (several complete seasons). Human subjective observations of transient events, colors, cloud species, snow textures, and other features will be a value-add. During excursions we'll be gathering climatological and glaciological data continually.

I got the chance to design a couple of equipment packages to support science on excursions, which I called the *WellsREP*, the Wells Rover Exploration Package, and the *WellsSEP*, the Wells Surface Exploration Package. (The names are in honor of H. G. Wells, whose tripedal "war machines" bear a passing resemblance to a WellsSEP. . . .) The designs were based on experience gained from robot landers.

The WellsREP is a rough cylinder you could cradle in your arms. It rides on the outer hull of the rover. At an investigation station, it is picked up by a manipulator arm and applied to surface samples of interest. The idea is to allow a close-up inspection of surface samples without requiring a full EVA, or the import of samples into the interior. It is based on a cut-down *Beagle 2* PAW (position-adjustable workbench); the mass is only a couple of kilograms. The key instruments are an ice core grinder, a microscope, an X-ray spectrometer to examine elemental abundance, and a Mössbauer spectrometer for analysis of iron compounds.

The WellsSEP (see the figure) is a package of seismometry and climatol-

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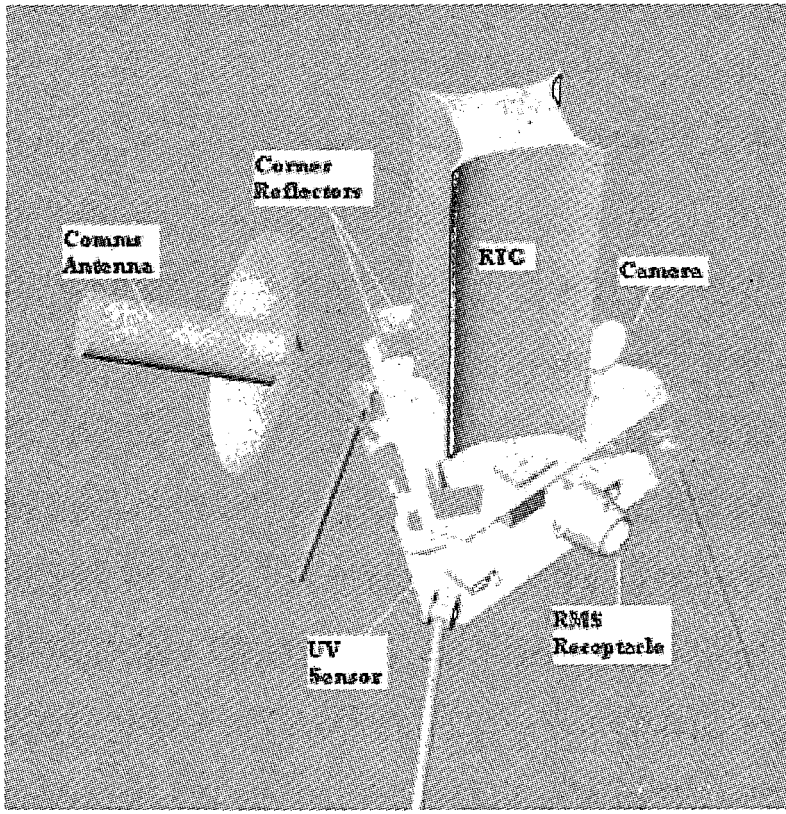

Figure: The WellsSEP fully deployed. Figure copyright Bob Parkinson

ogy instruments named by analogy with the Apollo Lunar Surface Exploration Package (ALSEP). The idea is we'd establish a network of WellsSEPs around Pole Station and during excursions. Powered by a radiothermal generator, each WellsSEP is intended to sample its environment through at least two full Martian years, communicating with Pole Station via orbital comms systems. As part of an extended seismometry network, the WellsSEPs will contribute to a deep mapping of the internal structure of the permanent ice cap.

The WellsSEP when set up is a tripod whose head contains a science package positioned at a height of four meters above the ice surface. The legs are jointed, with eight segments each, to be unfolded and positioned by astronauts on the surface. The tripod is designed to be stable in Martian winds up to 10 m/s. You need the height, as the science instruments should be positioned above the winter snow, which can lie two meters deep. Also there can be significant climatic variations over this scale; close to the surface a drop in temperature of several degrees per meter is common, and thermistors and anemometers are installed along one tripod leg to monitor these variations. The instruments include a seismometer, a meteorology package, a gas analysis package based on a mass spectrometer, photometers to measure sky brightness, a UV sensor, a

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dust impact sensor, and a camera.

The figure (prepared by Bob Parkinson) gives you an idea of the depth we went to in these studies. Throughout the exercise we made quite conservative assumptions about technology advances; we were aiming for plausibility rather than prediction. But by the nominal mission date, miniaturization trends can be anticipated to have delivered powerful packages with an economy of size, mass, and power requirements—"labs on a chip."

All these activities will yield invaluable results. But the real reason to send humans to the north pole of Mars is to extract an ice core.

Ice Cores on Mars

On Earth, ice cores have yielded climate records with an accuracy of a year reaching back some 100,000 years into the past. Can we achieve similar successes on Mars? There seems every prospect. Some workers have already found a correlation between Mars's obliquity changes and the thickness of strata visible to Mars Global Surveyor.

Martian ice, however, is deposited by different physical processes on a different world. And the first thing to recognize is that a Martian core will be a lot more compressed than anything on Earth.

Just as on Earth, Mars's permanent north pole ice cap has been built up layer by layer through the annual deposition of snow. On Mars, however, the principal component of the snow is carbon dioxide ice. When the spring sun sublimes away the carbon dioxide you're left with a residue of water ice, a mere one seventh of a millimeter per year. That compares to Greenland, say, where you get an annual (water-ice) snowfall tens of centimeters thick. The layers thin further through compression and ice flow. Dating these fine layers with the precision achieved on Earth may be impossible. However the thinness of the layers offers the prospect of extracting records covering significant periods of time from comparatively shallow cores—a million years in a hundred meters.

A further complication is ice flow, which can mix up the layers. But because of the deeper cold and lower gravity, ice flow is much slower than on Earth. And the pole itself, at the summit of the cap's parabolic profile, should be a stationary point in the flow, and may be an optimal location for coring into undisturbed layers.

Given your ice core, how do you interpret it?

On Earth you extract past temperature records from ice strata by using a "temperature proxy," some measurable property that depends on the temperature when the ice was formed. In practice, ratios of isotopes, notably O-18 to O-16, and H-2 to H-1, are measured. It takes more energy to evaporate water molecules with heavy isotopes from the ocean surface, so less heavy isotopes are deposited in cold periods than during warm periods.

Perhaps a similar temperature proxy can be established for Martian ices. The water-ice which is snowed out on Mars is not, of course, lost from an ocean by evaporation but through sublimation of exposed ice, at the summer pole and from low-latitude frost and snow residue: different physics will mandate a different proxy. Alternatively a temperature proxy based on an entirely different process may be established. As the saying goes, this is a significant area for further research.

As regarding dating, the absolute dating of ice layers will be essential for a full stratigraphic understanding. We don't know how to do this on Mars. Methods may include the study of beryllium isotopes from known supernova events, volcanic ash dating, and luminescence dating.

Ice core records on Earth are also correlated against independent records of historically dated events, such as vol-

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canic eruptions, or global climatic events dated through techniques like tree-ring analysis. We humans have left global signatures too, including "nuclear horizons," fall-out from massive atmospheric thermonuclear weapons tests of known dates. The lack of such correlative signposts will hinder the dating of Martian ice columns.

There are, however, some significant signposts, which may be used to establish at least a skeleton timescale. Given a surface deposition rate of 0.14mm per year:

Scale = 1cm (decades) Major dust storms, as observed historically, should leave traces in the ice column. The global dust storm of 1971 (Mariner 9) would leave a layer 9mm below the ice surface (by the year 2038), with the astronomically observed storm of 1956 a little deeper. There were only ten "planet-circling" events between 1873 and 1996, while only the 1971 storm was truly global.

Scale = 10cm (centuries-millennia) Major energetic cosmological events such as supernovae or gamma-ray bursters, known from history or Earth-based astronomy, would leave spikes in the population of cosmogenic relics. The Crab supernova of 1054 would leave traces 14cm deep.

Scale =1m (tens of millennia) An impact event on Mars just large enough to create a global microtektite deposit should occur once every ten to a hundred thousand years, so leaving layers some 1–10m apart. The distribution of tektites might give some indication of the distance to the originating crater, which if found could provide a dating calibration. Meanwhile the tektites' composition could yield some indication of the impactor's nature. Conversely the ice column should yield a record of varying impact rates through Mars's history.

Scale = 10m (hundreds of millennia) The planet's obliquity oscillates with a period of 120,000 years, with amplitude variations on a period of 1.6 million years. When obliquity is low, massive permanent polar caps of carbon dioxide may form. Globally the air will be thin and clear and comparatively dust-free: there may be no global dust storms. When obliquity is high, the air will be comparatively thick and dust-laden. Thus "clean" ice is deposited during times of low obliquity, and "dirty" ice in epochs of high obliquity, so there should be a layering in the embedded dust about 10m thick. This layering may already have been observed by orbiters.

Scale = 100m (megayears) Recent discoveries made by the Mars Express orbiter indicate that there may have been flowing water on the surface of Mars in episodes as recently as a few million years ago. If so, salty deposits evaporated from the transient water bodies' surfaces and scavenged from the air at the poles may be detectable at these characteristic depths.

Scale = km (deep time) Extra-Martian meteorites would result from significant impact events on the terrestrial planets. Relics of known impact events on Earth discovered as meteorites in the Martian ice column might allow comparative dating. However traces of the Chicxulub dinosaur-killer asteroid strike—bits of the Caribbean sea floor blasted to Mars—may be detectable only in the very deepest layers of the ice.

The extraction and interpretation of an ice core is central to the human rationale of Project Boreas. But there are several doctorates-worth of further work to be done before this sort of study becomes a reality:

We have no accepted technique for the absolute dating of layers of Martian ice cores.

We have no temperature proxy for Martian ice.

We have at present no database of comparative studies (like tree rings on

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Earth) against which to interpret Martian ice core results.

We could make progress on a lot of these issues with Earth-bound studies even before we get to Mars.

Martian ice cores offer huge scientific returns, then. But the challenge of extracting them is going to be significant.

Drilling on Mars

Ice core drilling on Mars has been studied since a remarkable 1977 proposal to use Viking-class technology to return a core sample of Martian polar ice (see R.L. Staehle et al, "Mars Polar Ice Sample Return Mission," *Spaceflight* Nov. 1976, Nov. 1977, Dec. 1977). And it's been done in fiction: Chinese and American astronauts drilled in search of life at the Martian north pole in *The Secret of Life* by Paul McAuley (2001).

You can consider going to shallow depths (meters), medium depth (a hundred meters or so), or deep (a kilometer or more—the Martian north pole cap is three kilometers deep). Shallow-depth low-power drilling has been studied in the context of robotic explorers. Beagle 2 (2003) carried a shallow drill. During the Apollo missions, core samples of 1-2m were taken with hand-driven boring devices.

On Earth you can buy medium-depth drilling rigs off the shelf, weighing a couple of hundred kilograms and needing a couple of kilowatts of power. You can load such rigs in the back of a truck and assemble them on site. NASA's Astrobiology Technology and Instrument Development Program has been trialing a rotary drill system in the Canadian High Arctic.

Deep drilling, however, is orders of magnitude more challenging in terms of mass, power, and manpower. The "GISP2" project (Greenland Ice Sheet Project 2), initiated by the Office of Polar Programs under the U. S. National Science Foundation in 1988, drilled through the Greenland ice cap summit to a depth of some 3km. GISP2 was a five-year project involving fifty people on-site. Heavy lifting was provided by the U. S. 109th Air National Guard. It's going to be tough assembling such resources on Mars.

The most useful study on Martian deep drilling was presented at the Mars Society's first convention by Frankie et al ("Drilling Operations to Support Human Mars Missions," in *Proceedings of the Founding Convention of the Mars Society*, ed. R. Zubrin et al, San Diego 1998 [MAR 98-061]). This used NASA Design Reference Mission technology as then defined, with the drill rig built into a dedicated lander, and liquid carbon dioxide extraction equipment (the liquid is used as a working fluid—see below). Frankie's study was in the context of drilling through rock in search of liquid-water aquifers, but it is applicable to ice drilling because, as Frankie notes, "Permafrost at Martian temperatures is as hard as basalt and as sharp as glass."

In trying to come up with a feasible design for Boreas, we were faced with a series of tough choices. How are you going to do the drilling in the first place? Rotary drilling is familiar, relatively low power, mechanically simple, and easily fixed in case of failure. But it requires a heavy support infrastructure, and in the dusty, cold, high-friction Martian environment any moving-part system would be vulnerable to many failure modes—lubrication failures, abrasion of bearings, metal fatigue, loss of seal integrity. But "advanced" drilling methods—such as the use of lasers, electron beams, and microwave jets—are power hungry, perhaps three to five times as much as traditional techniques.

Though shallow-depth and medium-depth drills can be run dry, a deep borehole will require stabilization, for it would otherwise collapse because of the weight of the ice. The way this is done on Earth is to pump in a "working fluid," such as water or mud slurry. But if contamination is an issue, an inert hydrocarbon may be used; GISP2 used

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butyl acetate. Water or mud is *not* going to work in Martian conditions. Possibly some low-temperature vacuum grease or lubricant oil would be suitable, but mass constraints prohibit importing fluid from Earth: a Lake Vostok bore utilized fifty tonnes of kerosene, for example. If lost, such a fluid load could not be replaced.

Can working fluids be produced from local materials? Frankie argued for the use of liquid carbon dioxide as a working fluid, extracted through ISRU. Carbon dioxide is the only readily available fluid, has low viscosity, and has the right thermal properties in Martian conditions, though pressure would have to be maintained in the borehole. Though there would be a cost in extracting, liquefying, and pumping the carbon dioxide, this minimizes the weight of fluid to be transported to Mars, and it is replaceable if lost. But carbon dioxide plus liquid water yields corrosive carbonic acid. You would have to keep temperatures low enough throughout the borehole that ice chips do not melt, which will affect drilling rates.

In the end, such considerations simply broke our budgets. Frankie's design would have weighed thirty tonnes and eaten five hundred kilowatts; the *total* landed mass for our study was to be just over sixty tonnes. And whereas GISP2 had fifty people on site, we will have a maximum of ten astronauts, with perhaps two guys available to drill at any one time, in spacesuits, working under the constraints of planetary protection protocols. We just couldn't do it; we had to compromise.

So we settled on a medium-depth drill, capable of reaching to depths of a couple hundred meters or so. At such depths we can run dry, without a working fluid.

As it happens this doesn't wreck our science objectives. Because of the lower deposition rate on Mars, even a hundred-meter core would reach back deep in time, covering several precessional cycles. We wouldn't be able to sample the deepest and oldest layers, perhaps including any trapped bodies of water, any basal melting, and the lithography of the sub-cap rock. But the ice core results could be complemented by other studies, such as sampling exposed strata in the walls of the spiral canyons, visited during EVA excursions. Of course for this to work you would need to establish a reliable stratigraphy for the polar deposits.

The drill would be small enough to pack on the back of a rover trailer, run off a rover power supply, and to be operated by a two-person team. We will use rotary technology to drill a dry hole into the Martian ice. A core of diameter 82mm is taken to a depth of 250m. The winch tower is 2.65m high. The system's total mass is about 250kg. This includes a winch with a 250m cable, a drill sonde, a containing tent, and science processing equipment. The total power requirement is about 4kW. The core is removed in sections 2m long by tipping the winch tower to a horizontal position and extracting the inner barrel containing the core and ice chips. Each section is transferred to a science processing fold-out workstation, large enough for one core section at a time to be handled, sampled, and analyzed.

All operations, including drilling and sample processing, take place within a "tent," a hemispheric dome supported by inflatable struts. The dome is there for environmental protection from such hazards as dust, carbon dioxide snow, and UV degradation, and for planetary protection.

During normal operations two astronauts will be required to man the drilling operation, one to oversee the drilling itself, and one at the science workstation. We figured it would take around 32 six-hour EVA sessions to extract a drill core of length 250m. That would give you the chance to take repeated cores in the course of the mission.

In the near future ice core drilling on

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Mars is not going to be like the heavy-lift operations of the Antarctic and Greenland. It will be more like the heroic efforts of Lonnie Thompson (see M. Bowen, *Thin Ice: Unlocking the Secrets of Climate in the World's Highest Mountains*, Holt, New York, 2005), who since 1983 has been taking medium-depth ice core samples from tropical or near-tropical glaciers, from Peru to Tibet and even Kilimanjaro, at altitudes too extreme for heavy-lift support. Typically six tonnes of equipment is carried to the drilling site and an additional three tonnes of core sections are carried back, using whatever transportation is possible, often the backs of graduate students and other beasts of burden.

Life on Mars

Our report is pretty comprehensive, I think, covering base design (inflatable modules on stilts, to keep out of the dry ice snow), life support, local resource usage, IT and comms aspects (you can't see synchronous satellites from the poles, so we have a network of high-inclination "Molniya"-like relays), science goals, psychology—and, most fascinating, exploration objectives, including jaunts down those spiral canyons.

We were cautious in our technical projections, and there's something of a paradox here. Our purpose was to show that a Mars polar base is feasible with (more or less) present-day technology, but of course by 2037 technological advances may have rendered all our assumptions invalid. In particular you could imagine smart robots capable of running their own science programs making it unnecessary to send humans at all.

But it's going to be a while before robots can carry out the sort of integrative interpretation humans would be good at in such an environment, where physical processes work together on every scale from the microscopic to the global: planetary mass cycles focusing down to each snowflake. And any roughneck would tell you, I suspect, that it will be even longer before a bunch of robots can run a balky deep drill into ice of unknown properties on an alien world.

Further in the future still, the poles of Mars may have a crucial role to play in mankind's greatest Martian project of all. Ever since the first serious terraforming suggestions made by Carl Sagan in the 1970s, melting the polar caps' exposed ice is generally seen as a crucial first step. But the ethical dilemma of terraforming is epitomized by the fact that if the polar caps were melted, the delicate history they contain in their layers would be lost in slush and mud.

In the end, people will go to the Martian poles for exploration and wonder. Project leader Charles Cockell is considering a Ranulph Feinnes-style *unsupported* assault on the Martian north pole: no domes, no robots, just one human being with spacesuit and sled. But that's another story. ■

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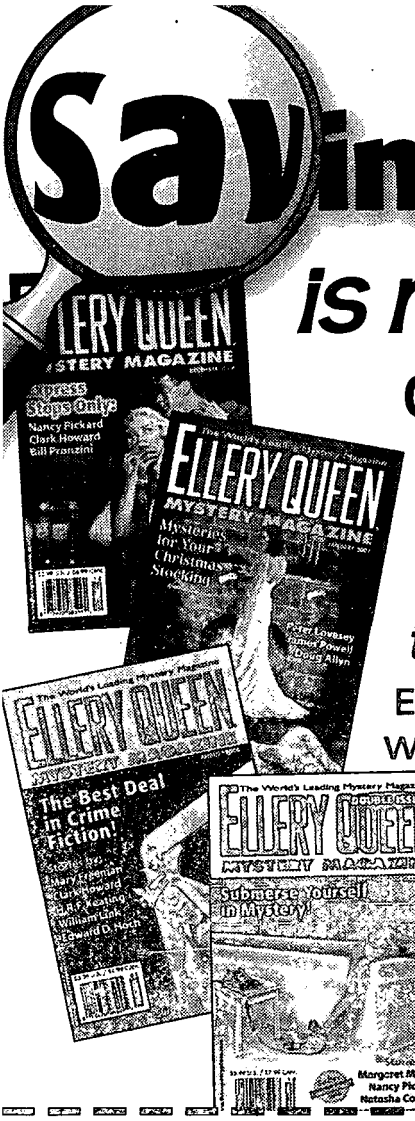

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Not Even the Past

Robert R. Chase

The scene of the crime looked like one of the old standards—but with some very important differences.

The comfortably claustrophobic kitchen had been specially designed for cooking in a less-than-one-atmosphere environment. There were half a dozen pressure cookers of various sizes, all with transparent lids and LEDs displaying the pressures and temperatures within. I even had pressurized ovens in addition to the usual microwaves. And I had the advantage of decades of chefs who had had to cook at less than a standard atmosphere.

On the other hand, I was not sure how to adjust for the incrementally decreasing gravity. My intuition was that it should slow convection and so, to some extent, offset the lower air pressure. It made preparing multi-ethnic *haute cuisine* even more of a gamble, but that's one of the things I like about my job. I am always learning something new.

Buzzers began to sound one after the other. I moved the pans to the cart, depressurizing them slowly to keep them from blowing up on me, and removed the handles. The pans were now plates. I counted out the proper amount of nouveau art deco silverware. Almost the entire design of the *Outward Bound* was nouveau art deco, from the metal-framework pin lights on the ceiling to the exquisitely cut rugs. The one exception was the nineteenth-century Ruritania-style crew uniforms. These served no useful purpose save to inspire my current nom de guerre.

I pushed the cart into the main lounge, carefully keeping my gaze lowered as I served our very important passengers. Besides aiding my image as an obsequious servant, it kept me from staring out the glass wall at twelve thousand miles of nothing. It may seem odd that someone who has jumped out of airplanes and rappelled down from helicopters should be afraid while cosseted

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by cutting-edge twenty-first-century technology, but in those situations, I at least felt I was in control. In the *Outward Bound*, I was too aware that my life was hanging, almost literally, by a thread and that if it snapped, there would be absolutely nothing I could do about it.

I served nearest to farthest, so no one could make accusations of favoritism. Narayan Singh got the Kashmiri Gustaba. His neatly trimmed, graying beard was the only sign of his sixty plus years. Dark eyes beneath his turban moved quickly from one to the other of his luncheon companions.

"Why do you insist that we are being treated poorly by the Beanstalk Corporation, Mr. Zhao?" he asked. Beanstalk was the Japanese-American joint venture that had nudged asteroid 2009 AP_{15} into geosynchronous orbit so that it could be used as the raw materials for the space elevator we were presently ascending.

Annie Jackson received the shrimp salad and can of Foster's. I opened the can carefully. These were said to be especially prepared cans with lower carbonation, but already one unfortunate incident had reminded Vice Captain Piper of the fountains at the Bellagio. "Thanks, Rassendyll," Jackson said. "I have to agree with Mr. Singh. After all, Beanstalk won the rights to the asteroid fair and square. They could have frozen out all the rest of us. Instead, they have invited us in as partners in what promises to be an extremely profitable venture."

"To open the solar system to all so that mankind may make a new start unconstrained by the mistakes of the dead past," Captain Miyamoto said, parroting the company line. It was hard to tell if he was being ironic—inscrutable Orientals and all that. He nodded as I gave him the *sashimi* and soy sauce. Inscrutable or not, he had been feeling an increasing tension the past three days, and his appetite had suffered accordingly.

Zhao Changxing received the last plate, boiled beef with noodles, along with chopsticks to complete the regular place setting. Of all of them at the table, he was the only one not to acknowledge my existence in any way. I might as well have been invisible. Which was fine with me.

"Your principals would never choose to be represented by fools," Zhao said. "It is insulting to me and demeaning to yourselves to pretend to be fools. Fetterman and Ishikawa, the controlling partners of Beanstalk, know that the power they have makes them targets. The beanstalk itself, from the sea-based platforms anchoring its two completed cables, all the way up to Laputa Station, is indefensible from terrorist attacks. In the old days, someone in their position might have tried to pay off prospective terrorists. Fetterman and Ishikawa prove their superiority by arranging to have prospective terrorists pay them."

"Just a moment now," Jackson objected. "You can't mean—"

"I mean my country would have been able to make the first legal claim to ownership of the asteroid if our spacecraft had not exploded on the launchpad." Zhao stared at each of the others in turn. "No investigation has ever explained the cause of that explosion in a satisfactory manner."

Each of the junior partners had been allowed to take one aide with them. Zhao's was Zin Chondin. At the age of fifteen, she had charmed the world while winning an Olympic gold medal in gymnastics. Four years later, she was back in competition, but the little girl was gone, replaced by an emotionless perfectionist the press dubbed the Ice Goddess. Now she was in a whole new game. She sat on a sofa behind her boss, ready to go for anything he might need. As I passed by, I handed her a mug of buttered tea. "Sorry it can't be as hot as you would like it, given our air pressure."

"No need to apologize, Rudy," she said. "I grew up on lukewarm tea."

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I took my seat behind her. It was situated so that I had a view of everyone in the room, ostensibly so that at the lift of a finger I could jump to my feet and pour coffee or take an order back to the kitchen. It had the additional benefit of putting the glass wall behind me. I could at least pretend that I was in a building firmly rooted to terra firma.

And I could muse on Zin without being obvious about it. She moved with an athlete's unself-conscious grace. Her features suggested a mixture of something other than Chinese, though I could not put my finger on it.

My thoughts were cut short by raised voices at the main table. "And don't think that I miss the message sent by the seating arrangements," Zhao said.

"What do you mean?" Singh asked.

"India to my right, then Australia to my left, and finally Japan," Zhao said. "Just like on a map. And the Americans, who set this noose around a country they are right to fear, hiding in the background, pulling the strings."

"Oh, come now," Jackson objected.

"It is not surprising that members of the so-called Anglosphere would ally against us," Zhao said. "But your people, Miyamoto." Zhao stood, towering over them. At well over two meters, he was much the tallest person in the room. "They should never have allowed themselves to become lackeys. Is there no flicker of pride, of *bushido,* left in you?"

Miyamoto got to his feet. As did I, judging how quickly I could get between them. Beating up honored VIPs was not part of my job description, but it would be better to do that, if necessary, and be dismissed in disgrace, than to allow an all-out brawl to occur.

"I think it would be advisable for you to leave the table," Miyamoto said. "Now."

Zhao stared down at him for a moment. "I have lost my appetite in any event." He turned and strode from the room. Zin followed dutifully after him. A few minutes later, Singh and Jackson made their excuses.

Miyamoto was still clenching his fists as I came over to clear the table.

"Only one more day," I said.

"Not soon enough," he growled.

Plates and tableware went into the dishwasher and thirty minutes later were ready for storage. One of the things about working in a variable gee environment is that you can never just put something in a cupboard and rely on gravity to keep it from wandering. Every plate slides into a slot and then a door locks shut, securing everything in place. Each fork and spoon snaps into its assigned position in the drawer. One of the advantages of this system is that it becomes immediately evident when anything is missing.

Like a knife.

I went back out into the dining area and examined table and chairs to see if I had missed anything. Not so much as an embroidered napkin. The table had been set with four knives. Only three had come back.

I raised my tracy to punch the digit that would put me in immediate contact with the captain. Before I had the chance, Miyamoto's panicked voice came from the speaker.

"Rassendyll. Come up to cabin 103 immediately. Mr. Zhao has been stabbed."

I learned later that Miyamoto had been in the control room with Vice Captain Piper when an emergency call came in from Zhao's cabin. Zhao was screaming incoherently in Chinese. Miyamoto did not need a translation to know that Zhao was in serious trouble. He was down the companionway and in front of Zhao's door in ten seconds.

The door was locked. This was no ordinary stateroom door. More than anything else, the cabin doors on the *Outward Bound* resembled submarine bulkhead doors. The idea was that in event of hull breach, each cabin would

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be able to maintain its own air pressure until repairs could be made. It would take an industrial laser a good fifteen minutes to cut through the lock.

Miyamoto smashed the emergency glass at the side of the door and inserted a key that he kept clipped to his belt. The bolts disengaged. Even then, the door did not open. A chair had been placed beneath the surprisingly ordinary interior doorknob. Miyamoto had to throw himself against the door three times to knock the chair out of the way.

Zhao lay on the floor of his cabin. The only light in the cabin spilled in from the corridor. Although the *Outward Bound* had been designed for luxury, the constraints of a car climbing the Beanstalk meant that space was limited. The most that one could say for Zhao's cabin was that, though it was eight feet high, it was basically the size of a large walk-in closet. On the left, a bed which could fold down from the wall. On the right, a fold-down desk and a door to a very small bathroom. The far wall was transparent, like the wall in the dining room.

I could not have been more than a minute behind Miyamoto. By now, the motion sensors had brought up the room lights. Miyamoto was kneeling on the right side of Zhao, administering first aid. Zin was on Zhao's left, sobbing.

Miyamoto had covered Zhao's throat with clotting foam from the kit he had had the presence of mind to grab. Judging by the pool of blood surrounding him, this was likely a futile effort. My missing knife was on the carpet two feet away.

I knelt next to Miyamoto, wondering how I could help. "I don't think he's breathing."

Miyamoto gave a quick nod. "Get the defibrillator out of the kit."

Modern gadgets are wonderful. Once you have set the paddles on the patient's chest and pressed the ON button, the defibrillator delivers timed shocks while monitoring the patient's condition.

It also determines when to end the effort. "Resuscitation not possible." The calm, alto voice seemed to issue from Zhao's chest. "Procedure being terminated."

Zin's sobbing became a wail.

"This is the sort of thing you were hired to prevent, Angelo," Sphinx said. He was wearing a deep voice today, maybe late Sydney Greenstreet. Someday, my curiosity might be satisfied and I would learn if Sphinx was man, woman, or machine. On the other hand, it was probably safer not to know.

"Yeah," I agreed. I paced my cabin, talking into my headset. It had all the latest security features. Not only did it encrypt everything I said, it also generated an innocuous conversation for any prospective eavesdroppers.

"What else?"

"I gave the room a thorough examination before I left, top to bottom. There was nowhere for anyone to hide, including that minuscule bathroom."

"So Mr. Zhao was murdered in a locked room. Quite curious. Do you have a suspect?"

I shrugged. "Everyone on board. Zhao had a talent for making himself disliked."

"If I had to guess . . ." Sphinx began.

I waited, not wanting to be pulled into Sphinx's mind games.

"I would choose you, Angelo. You have the skills necessary to the task. And your antipathy to the Chinese is well documented."

"Untrue," I said. "I have dozens of Chinese friends, from Taipei to Singapore."

"I stand corrected. It is your dislike of the current mainland government that is well known."

"And we both know," I said, "that if I were to do anything so unprofessional as to kill someone I had been paid to protect, we would now be lamenting Mr. Zhao's death from natural causes."

"Ye-e-es." Sphinx sounded pleased in

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spite of himself. "Around you, only natural causes and accidents. One of the reasons your services are so highly valued.

"Well, how do you propose to proceed?"

"I think it's time I drop my cover and start asking questions. We are still a day from Laputa, and I have no idea what the legal situation is when we arrive."

"Nobody does," Sphinx said, with the suggestion of a throaty chuckle.

"I'll do what I can to preserve the evidence. The passengers should find it reassuring that some sort of investigation has started."

"And our client will be pleased with the indication that it is finally getting something for its money."

Miyamoto called a general meeting and made a short announcement of Zhao's murder. The he reintroduced me as his security officer and informed the passengers that I would be taking statements from all of them. They were to give me their full cooperation in order to bring the murderer to justice as well as for their own protection.

"But who is going to feed us?" one of the aides asked.

I got Miyamoto's statement in the kitchen's walk-in freezer. Zhao's corpse was being preserved as best we could among the steaks and chops. While I examined the body, Miyamoto recounted getting Zhao's call, running to Zhao's cabin, opening the door, and finding Zhao on the floor with one of my steak knives sticking out of his neck.

"Was he conscious when you arrived?" I asked. "Did he say anything?"

The cold had dried the foam Miyamoto used to seal the wound. It flaked off cleanly under the blade of my butter knife.

"He was trying to say something, " Miyamoto said. "He must have known I could not understand him, because he switched to English. I caught the words 'in the' clearly. Then he paused, maybe for breath, but I thought he was searching for a word. Then he said 'stars.' He was on his back, but he was able to raise his arm part way. I looked through the window. I could see the stars, but there was nothing unusual about them."

"Then what?"

"I knelt down beside him. That's when I saw the knife. I got the sealant foam out of the first aid kit before doing anything about it. Even though there was a fair amount of blood already, I feared there would be a gusher when I removed the knife. So I pulled the knife with one hand and sprayed with the other."

"When did Zin show up?"

"Just about the time I pulled the knife, I think. I felt a tremor and heard a gasp. Then Zin rushed in and threw her arms around Zhao. I had to push her away so I could work. When she saw the blood on her hands, she became almost hysterical."

I looked up from my examination of Zhao's neck. "How many people on board would you say are left handed?"

Miyamoto did not answer immediately, surprised by the apparent change of topic. "I am. I can't recall noticing anybody else. Why?"

"Take a look at the back of Zhao's neck. I am not a crime scene technician by any means, but it looks like this starts as a puncture wound, the knife jabbing pretty much straight in. Then it slices to the left.

"Now it is certainly possible to hold one of these knives with the sharpened edge pointing to the left and, having made the stab, to push it further in that direction. However, it would be awkward. The more natural action for a right-hander is to hold it with the edge facing right and then, after stabbing, to pull it in that direction."

I did not say it, but I had also noticed that the wound seemed to be directed down toward the chest. If Zhao had been standing at the time, the knife

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would have started above him. But there was no one even as tall as Zhao on board.

Miyamoto listened to this with increasingly wide eyes. "Why would I do such a thing?" he asked.

"I haven't said you did. But, to answer your question, for the same reason anyone else on the *Outward Bound* would have. Zhao was a master of irritation and provocation. His snit in the dining area was only the most recent example. For all I know, you all drew straws as soon as I left the room and you were the lucky guy chosen to do the deed."

"I tried to save his life," Miyamoto said heatedly.

"Zhao's room was locked," I said. "The only person who could get into that room is the person who did indeed get in: you. You had at least a minute before Zin came in behind you. Plenty of time to stab someone in the back. Taking along the first aid kit was inspired. Knifing someone can be messy. Attempting first aid, at least giving the appearance of doing so, would give you the perfect excuse to have blood on your hands and your fingerprints on the murder weapon."

Miyamoto was starting to sweat. I felt a bit sorry for him, especially since I did not really believe what I was saying.

"I was in the Control Room with Vice Captain Piper when we received Zhao's call," Miyamoto said. "Piper was with me at the very moment Zhao was being murdered."

"We don't really know what Zhao said. You described him as 'screaming incoherently.' Maybe he was just upset that his bed had not been made up the way he liked."

I led Miyamoto out of the refrigerator to the circular third level corridor. Miyamoto stared at the floor.

"I'm not saying I would arrest you even if I had the authority," I said. "But if these thoughts occur to me, they will certainly occur to the official investigators. You will want to have something convincing to say to them."

I decided to interview everyone else in his own cabin, on the off chance that I might pick up a clue, if not to method then perhaps to motivation. Zin's room, located right next to Zhao's, gave absolutely no clue to her personality. We had been on board for almost two days, yet no pictures or books had been placed on the small writing table. If she had family, a boyfriend, any sort of personal life, there was no indication of it. It also seemed at least five degrees cooler than any place else on the *Outward Bound*.

She sat on the fold-down cot, seemingly immersed in her own thoughts, as I entered. Then she saw what I was carrying on my hip.

"What is that?" she asked in surprise.

"What it looks like," I said. "It's a .32-caliber semiautomatic pistol."

"You would use that in here?" she asked incredulously. She gave a quick glance to her shuttered window. "You could kill us all."

I shook my head. "It's loaded with safety slugs. Thin-walled jackets filled with number twelve shot. They fragment on impact so as not to go through walls or people. 'Stopping power maximized by complete dispersal of bullet energy into the intended target with immediate shock and trauma,'" I said, quoting the ad copy. "Air marshals have used them for forty years."

Zin turned her head away. "I think there has been enough shock and trauma—and blood. Do you really believe you need that protection?"

"There are two schools of thought about that," I said. "One is that the murderer is a member of one of the nut cults that never wanted the Beanstalk built, that it's an affront to Mother Gaia or will be used to pollute the rest of the solar system or whatever. If so, we may all be at risk.

"On the other hand, it may be that the murderer had a personal reason to kill

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Mr. Zhao. In that case, I may be the only one in danger simply because I am asking questions. My hope is that packing a .32 will make me an unattractive target."

I gave her the self-deprecating smile that had been so charming when I was chef and waiter. No reaction. Her head was still turned away. Time to take charge of the conversation.

"Where did you go after lunch?"

"I came right back here. I had papers that still had to be prepared and checked before the Laputa signing ceremony."

"Did you hear anything unusual?"

"No, not at first. I was concentrating on my work. Then, there was a sort of thumping coming from his room. I thought he must have been throwing something at a wall." She looked at me apologetically. "Mr. Zhao was under a great deal of stress. He would kick or throw things sometimes. He meant nothing by it."

"Then what?" I prompted.

"There was a scream." Zin drew a deep breath and shuddered. "I could not make out any words, but I could hear the fear and pain. I ran out to the corridor. Mr. Miyamoto was just opening the door. I looked in and saw on the floor . . ." She put her fist to her mouth, blinking away tears.

"Can it be true?" she asked.

"Can what be true?"

"The rumors. The stories you see on obscure telezines about creatures living in the upper reaches of the atmosphere, or even in space itself. There are pictures taken by satellites from a distance. Sometimes they look like flying saucers. Other times, more like huge, celestial jellyfish."

"Some say they aren't material at all, that they are energy beings. Walls and doors would mean nothing to them. They would be able come through just like light."

Her voice was getting higher, her breathing faster. She would work herself into hysteria if I did not do something quickly.

"I don't know anything about space-dwelling creatures," I said. "However, I am reasonably certain that if they exist, even if they were hostile, they would not choose my steak knives as the means to show their displeasure."

This time, I did get the smile. "Forgive me, I'm babbling. That was an absurd suggestion. The strain, you understand, has made me behave as if I have altitude sickness."

"Given how high we are, a little altitude sickness is forgivable. Just let me know if you remember any more details, no matter how insignificant."

Vice Captain Norm Piper seemed distracted during our interview. He kept his face pointed in my direction, and he would nod encouragingly from time to time, but his almost colorless eyes never really focused on me. Blond crew cut and overly regular features made him look almost like a store mannequin.

"Captain Miyamoto says you were with him in the control room when Zhao's call came in."

"Yeah. That's right."

"What time did Miyamoto come into the room?"

Piper frowned, as if it took extra effort to pull his mind away from wherever it was to attend to my questions. "About 12:50. Earlier than I expected. He was in a bad mood. Zhao had been even more irritating than usual at lunch."

"He stayed in the control room with you until Zhao's call came in?"

"Yeah."

"There is some question about what Zhao said. Miyamoto doesn't understand Chinese—"

"I do," Piper interrupted. "He said that he had been stabbed and he needed help."

I must have looked surprised. "Mr. Fetterman wants every one of his executive staff fluent in either Japanese or Chinese." For the first time, his eyes met

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mine. "So you're a security operative, huh? Internal or contract?"

"I can't really go into that."

"Right. But you're the one responsible for keeping things like this from happening."

"People tell me that."

Piper smiled and seemed to relax. "That's what I thought. I was telling Miyamoto not to worry."

It might be a murder to most of us, but to Piper it was a potential blot on his resume, one that might impede his advancement in Fetterman Associates. It was a great relief to him to discover that I was the designated fall guy.

Narayan Singh's room was almost the opposite of Zin's. Overly warm where hers was cold, littered with personal touches where hers was almost sterile. He offered me tea, which I declined, as I sat down to begin the interview.

"Can you tell me where you were in the half hour between the end of lunch and Miyamoto's discovery of Mr. Zhao's body."

"I was in this room, reading Faulkner. Primitive societies fascinate me. Then I took a nap. As I am sure you remember, Mr. Zhao had been quite tiresome."

"Was your assistant, Bachi, with you any part of this time?"

"No. I understand he was with Jackson's assistant, being defeated in a game of ping-pong. So you see, I have absolutely no alibi."

"What do you think of Zhao's murder?"

"Really, Mr. Rassendyll, if that absurd name is truly yours, this is a time when I can be especially grateful that I am businessman instead of a diplomat. You saw how the man behaved, so it should not surprise you to hear me say that with Zhao's death the air is sweeter, the Sun shines more brightly, and children everywhere play more happily."

The old man was having entirely too much fun with this. He was throwing my questions back in my face and making me like it.

"Mr. Zhao was a tall man and appeared to be fairly strong," I said. "I imagine it would have taken someone nearly as strong to kill him."

"You note my excellent physical condition despite my advanced age. It is true. Until three years ago, I played polo. Last year, I bowled for the cricket team that won the Punjabi Cup."

"A suspicious man would note that you are the only one of our passengers who is always armed," I said.

He pulled the dagger from its sheath on his belt. "My *kirpan.* As a Sikh I wear this always as a matter of religious obligation." He brushed his thumb lightly across the edge. "I keep it sharp as a matter of personal preference.

"More importantly, this is the knife with which Zhao was *not* killed. That was a kitchen knife purportedly under your control."

I had been scanning the room as he talked. My eye was caught by a particularly ugly figurine of a four-armed woman with a necklace of skulls. She seemed to be sticking her tongue out at me.

"The goddess Kali," Singh said, following my gaze. "Not venerated by Sikhs, of course. A peace offering from my daughter after an argument during which we were both overly vehement."

"She looks rather bloodthirsty," I commented.

"Occidentals tend to think so. 'Kill for the love of killing! Kill for the love of Kali! Kill! Kill! Kill!' Most Westerners know of her only through two overly flamboyant films, the first far better than the second."

"Undoubtedly a misunderstanding caused by a paternalistic colonialism," I suggested.

"Not at all," Singh said. "The Thuggee were a murderous sect who had to be put down. You should read George Bruce's book; old, but it strikes the balance between research and readability." He leaned closer. "If you do, you will

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learn that their weapon of choice was not a knife, but a yellow scarf which they used to throttle their victims."

I considered for a moment. "Mr. Singh, I understand your lack of regret at Zhao's death. But being a son of a bitch does not excuse murder. If it did, which of us would be safe? In fact, none of us is safe until the murderer is caught. That is why I am sure you will tell me if you remember anything further that might shed light on his identity."

"Horrible," Annie Jackson said. "Just horrible. I mean, I didn't like him any more than anyone else, but the worst he deserved was a slap in the face. Or maybe a punch in the nose."

"How do you know?" I asked.

"Excuse me?"

"Do any of us really know anything about Zhao?" The question, far from being rhetorical, was born of my own frustration. Sphinx could access some of the best intelligence sources on the planet, but had been able to provide me with precious little about Zhao. "We have the officially tailored biography released to the press, and if we Google his name, we can see how that biography has been retroactively adjusted as he has climbed in the hierarchy. What we don't know is whether a single word of it has ever been true. China is the one country that has been able to completely control the internet."

"Hmm," Jackson said doubtfully. "I suppose that is right, but he never impressed me as a man hiding great secrets. Just a bureaucrat trying to make everyone acknowledge that he was actually as important as he wished to be."

"Did you see him at any time between the end of lunch and the time he died?"

She shook her head. "I was in the game room for fifteen, maybe twenty, minutes watching my aide, Elaine Evans, playing ping-pong with Bachi Bedi, Singh's aide. Nether of them was very good. The ball kept bouncing into high slanted arcs. Whenever Elaine aced him, Bachi lamented as if it were grand opera. They both got to laughing so hard they could hardly stand."

She was quiet for a moment. "It is almost as if those were our last few minutes of innocence. Then, to add to the horror of the murder itself, the fact that it seems to be an impossible crime."

I said, "You were chosen to sign the articles of agreement because of your position in Great Southern Dynamics."

Jackson sat up a little straighter. "Absolutely. We are the largest aerospace and defense contractor in the southern hemisphere. It only makes sense that we should be one of the signatories."

"Your stock value went up twenty points six weeks ago on the rumor that you had perfected an invisibility cloak."

Nervous laughter showed that she immediately saw where I was going. "Much exaggerated rumors, I assure you. Of course, we have been working on such a device, but we have quite a ways to go. I can't let you have classified details, but the truth is that for now it works on only the lower part of the spectrum."

"According to *Jane's Defence On Line,* the Australian Government issued a classified contract to your company for twenty million dollars right around the time of the stock increase. The interesting thing is that is was funded with procurement rather than research funds."

"Well, that could be anything."

"Of course."

"Look, Rassendyll, I know you have to find the killer, and I can understand why you might grasp at an invisibility cloak, if one actually existed. But if you have followed developments as closely as you appear to have, you know that there are serious difficulties with your theory. Wearing the cloak is like walking inside a small tent. The operator is nearly blind. Any holes for vision make the operator's eyes visible."

"Infrared," I said.

"And then you need special lenses sewn into the fabric. You carry a power

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pack for both the cloak and the IR goggles. As efficient as you make it, it gives off heat. You install a fan to pump the heat out. The fan cannot be completely silent, and the heat coming out of the cloak looks like a fire to anyone with his own IR gear.

"You are thinking that the killer knocked on Zhao's door and was admitted, knifed Zhao, then slipped out when Miyamoto broke in. Look around this room! It's the same size as Zhao's. You have to step out to the corridor to change your mind. Do you really think someone in a cloak could step around Miyamoto and Zin without brushing up against them, without someone hearing the fan or feeling the heat?"

"Not impossible," I said.

"Just bloody damned unlikely," Jackson replied.

"Would you object if I searched your room?"

"I most certainly would! But go ahead. You find nothing and will then be able to put this silly idea out of your mind."

It took less than fifteen minutes to prove her right.

Elaine Evans and Bachi Bedi were the only two people on board who had complete alibis for the time in question. By the logic of fiction, that should make them the guilty parties. The logic of reality pointed in the opposite direction. Elaine gave the impression of being tightly focused on mission, in some ways like Piper but with a personality. She might destroy me on the tennis court, and I could well imagine that the man who laid an unwelcome hand on her would find himself with a broken wrist, but there would be nothing covert about her motives or actions.

Bachi was an equally unlikely suspect, if for different reasons. Jokes and humorous asides did little to conceal a deep uneasiness about personal safety with a murderer on board, about whether there would be a signing on Laputa with one of the representatives dead. He could hardly keep his eyes off the holster of my .32. From his vegetarian eating habits (with which I had become intimately acquainted while acting as chef) and his conversation, he seemed to be at base a very serious Hindu. I had a feeling he had a crisis of conscience every time he used disinfectant on a cut.

"You don't believe in the Celestials," he said, almost reproachfully. It was toward the end of the interview.

"The what?" I asked.

"Celestials. Creatures of the upper reaches. They travel on magnetic lines of force and feed upon the radiation of the Van Allen belts. In their larval stages, they may appear from a distance to be spacecraft, but in mature form, they have been mistaken for aurora."

It took me a moment to realize that this was a more poetic version of what Zin had been talking about earlier. "You're right. I don't. If they did exist, why would they care about us?"

"Because we have invaded their space," Bachi said. He was painfully earnest. "Not temporarily with our spacecraft, but with a permanent structure that leeches away their power.

"What sort of relationship did you have with Zhao?" It was a question I asked both of them. Their answers were the same: no relationship. They were mere assistants. This tracked with my experience as chef. As far we could tell, he had never known any of our names.

Back in my cabin, I had my recorder print out a transcript of all the interviews. A quick scan confirmed my initial impression. I had nothing. Nobody liked Zhao, but nobody had a convincing motive for murder. If I were able to find one, I would still be faced with an impossible crime. Miyamoto would have been my choice, except that Piper said they were together when Zhao called in that he was being attacked. Singh was a suspect based on his general bloody-

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mindedness. Had he been trying to draw attention to himself? If so, why?

An odd thought occurred to me. I detached my chair from its anchors and placed it against the door. The top of the backrest fit snugly against the bottom of the doorknob. From Miyamoto's description, I had assumed that the murderer had leaned the chair against the door to wedge it shut. I saw now that it had not been leaning at all. Did that make a difference? Maybe it had not been intended to block the door. But if that was so, what was it doing there?

I realized suddenly that I was very, very tired. If I kept chasing my thoughts in circles, I would end up like Bachi, believing in energy life-forms that flew on magnetic fields and ate radiation.

Tomorrow we would reach Laputa. The authorities there could grill everyone to their hearts' content. Sphinx would be unhappy that I had not found the murderer. The hell with him. Let him fire me. Maybe it was time I got an honest job.

Something brought me out of a sound sleep. I stared into the darkness, wondering what had disturbed me. It took a moment to realize that it was the absence of something too low to hear, a vibration that had been present since the *Outward Bound* began its four-hundred-mile-per-hour climb up the Beanstalk.

The engines that powered the climbing wheels were off line.

I sat up quickly, nearly throwing myself off the bed. The lights, sensing my movement, came on and slowly increased in brilliance.

"Control room! This is Rassendyll. What's going on?"

"We are stopped." Miyamoto sounded disgusted. "I have been given orders to hold position until our legal status is clarified. I told them we don't have that much air."

I was still fuzzy with sleep. "But we can't just block the Beanstalk. What about the other cargo shipments?"

"There are two completed cables," Miyamoto reminded me with exaggerated patience. "The only other shipment behind us is on the other cable."

Right. I knew that. "What do we have for air?"

"It could last indefinitely, as long as we can draw power from the cable. Food and water are another matter. You probably have a better idea of that than I do."

I thought a moment. The kitchen had been locked since the murder. I had set up a sandwich bar with plastic utensils for the passengers to serve themselves. "Uh, three days. Six if we really stretch it."

There was a click as he cut the connection. I stumbled back to my bed. I could imagine the confusion on Laputa. Fetterman and Ishikawa had placed their ground stations in international waters in order to be free of interference from nations who might seek to tax, control, or nationalize their creation. They might be regretting that decision now.

The room took note of my lack of movement. The latticed pin lights dimmed and guttered out like—

This time I jumped up so violently that I landed a yard from the bed. "Miyamoto. I know who killed Zhao."

For the second time, I was just a few minutes too late.

Miyamoto helped zip me into the remaining spacesuit. "She must have realized something was up when I called her to the control room. She climbed out the top hatch and jammed open the outer door of the air lock. The bottom hatch is the only other way out.

"How did you know Zin was the one? For that matter, how could she kill Zhao? She entered the room after I did, when Zhao was already dying."

I sealed the helmet. Air rushed in behind my head as I turned on the radio. "That is what she wanted you to think.

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She was in the room as you entered. She was betting on the sight of Zhao's body and the fact that we are conditioned to think in two dimensions. She was in the lights above your head."

"That's—" Miyamoto cut off his own outburst as he thought through what I had been saying.

I pressed a button on my left wrist. The suit shrank in and became skintight as it conformed itself to my body contours.

"You can't just hang lights in an environment that varies between one gravity and free fall. They have to be fixed in place. That is why they are placed on decorative metal tubing, tubing which forms a surprisingly strong metal framework. Not strong enough to support a hundred pound girl, you would say. I would agree. But plenty strong enough to support a fifty-pound girl for a few minutes, if she spread her weight carefully among the supports. As we have climbed the Beanstalk, our weight has been decreasing due to the combination of gravitational attenuation caused by distance and the centrifugal force from the Earth's rotation.

"She stabbed Zhao, then placed the chair against the door. Not to block the door, as we both assumed, but to give her the extra height she needed to jump to the lights and pull herself into position before you forced your way in. As soon as you did, she dropped to the floor, making that thump you heard."

"Then running to Zhao was just to make a pretense of caring for him?" Miyamoto asked.

"More likely, it was to have an excuse for having his blood on her clothing."

"Why? Why did she kill him?"

"I have no idea."

We did the final safety checks of the suit. I kept waiting for Miyamoto to stop me and say something like "I can't let an untrained civilian go outside under these conditions. You will just get yourself killed. It's my responsibility." We would argue back and forth, but finally he would beat me down with his insistence that he had the special training necessary to operate in the vacuum outside the *Outward Bound.*

Instead, he clipped the tether reel to my belt. "Snap this onto the eyebolt just inside the outer hatch. And we don't want to forget this." He handed me my gun belt. We had to expand it to its fullest extent to make it fit around the spacesuit.

I stepped into the air lock. Miyamoto sealed the door behind me. Rungs slanted down about eight feet to the outer hatch. I found the eyebolt and fastened the tether. Then I pressed the button to open the outer hatch.

Blackness, complete and unrelieved. I could pretend I was back in high school, working no more than twenty feet above the stage, where the worst that could happen would be to fall and break a leg. All my friends would sign my cast when they visited and my big brother would joke that I should have played it safe by going out for football with him.

Grasping the tether tightly, I let my body swing down until my head was outside the hatch. The soles of my boots braced against the bottom of a rung. Then the Earth swam into view beneath me, so small, so far away, and I felt how high up I was. Vertigo reached out for me and tried to loosen my grip on the tether, to pull me into the unending void.

What I had to do now was let go of the tether with one hand and reach around the outside of the hull to find the exterior rungs. Forcing my right hand to release the tether was extremely difficult. My body weight may have been reduced to seventy pounds, but the suit had to bring the total up to one fifty. I did not want to support all that weight with one arm.

I relaxed my right hand. My feet slipped free of the rung with the de-

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creased pressure. My whole body pivoted around my left hand, which was still grasping the tether. I flailed with my right hand. Fingers hit a protrusion, grasped, held, as my legs swung into space. I pulled myself up, got my left hand next to my right, then reached for the next rung. I was at the fifth outside rung before my boots found purchase on the first one. I paused for a few seconds, panting. Sweat stung both eyes. Then I resumed my climb up the hull.

Near the top, the hull began to curve in from the vertical. I wondered what sort of welcome I would receive. I considered drawing my gun but decided against it. I wanted to keep both hands on the rungs for as long as possible.

Two more steps and I was jerked to a halt. I could not believe I had run out of line. Somehow the spool must have jammed. Briefly, I considered backing down the rungs and either unjamming the spool or getting an extension. Instead, I detached the spool and let it fall slowly away. I was even more afraid of what Zin was doing atop the *Outward Bound* than I was of falling.

Six more steps and I could see the Beanstalk rising up over the hull's horizon and vanishing into star strewn blackness. One of those dots, a day's travel above, was Laputa.

Two more steps and I could see Zin wrapping something like a plastic raincoat around the cable. My radio had been off so she would not be aware of my approach. Now I thumbed it on.

"Mind telling me what you're trying to do, Zin?"

She did not bother to look around. "I am about to cut the Beanstalk and send the *Outward Bound* hurtling to the Earth."

Another step and I felt secure enough to unholster the pistol. "It's tougher than it looks. I'm pretty sure you don't have the sort of explosives that could make a dent in it." I had gone through everything that came on board with the most advanced explosives sniffers before we launched.

Her laugh was half a sob. "This serves as my oxygen tent. I don't intend to explode anything. The Beanstalk is made of buckytubes. Carbon molecules. Like diamond. Like coal. I'm going to burn it."

"Why?" I was not sure of the chemistry, but that sounded horribly plausible. An extra oxygen canister was visible. I crawled up another step and lined up the sights with her center of mass.

"For justice. To protest the rape of my country, Tibet, by the Chinese. To protest what Zhao . . . did to me. Rape was not enough. When I was pregnant with his child, with *his child,* he forced me to have an abortion. So I could compete again."

The image sprang into my mind of Zhao grabbing Zin in an embrace, drawing her face up to his, unaware of the knife in her right hand that she would bury in the back of his neck. "Is that any reason to kill the rest of us?"

"It's not just Zhao. It's his whole country, the whole society. He dies, but China still becomes a partner in this glorious future of Laputa even if it has to sign by video. None of you care about justice, about the boots that stamp us down day after day after day."

I sighed. I sympathized with all my heart, but not enough to let myself and all the rest of the passengers and crew be killed. Time to end this.

That is when I discovered that my gloved index finger could not fit inside the .32's small trigger guard.

Here is what I think. Zin never intended to die, never seriously intended to kill all the rest of us. She'd had half an hour to work on the cable before I climbed up to her. She did nothing further while I talked to her. With Zhao's death, her main goal had been accomplished. I think she was waiting for me to come up and disarm her. That way she could live and become a *cause célèbre* at her trial. Her fans would rally to her cause,

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sympathizers would hear with horror about the security goon who had brutally prevented her martyrdom.

Neither one of us had remembered about the other cable. Even though less than fifty yards away, it was effectively invisible.

Far Horizon, the car climbing it at four hundred miles an hour, was not invisible. There was no vibration in our cable, no buffeting wind as it flashed by. Just an image that in an instant appeared, seemed on a collision course, and disappeared above us.

In that same second, a million years of evolution took hold. Zin let go of the cable and flinched. She began to fall slowly down the upper surface of the car.

She might have been able to grab on to something. She was a trained athlete with excellent reflexes.

Miyamoto had been listening to our conversation. Despite his orders, he started the climbing engines. As the car began to move, it hit Zin and bounced her sideways, out into space.

She had no tether. In a little more than a minute, she was lost to sight. Long afterwards, though, I could still hear her.

The world was upside down. Looking up through the transparent ceiling of Laputa Station's great hall, I could see the Earth, a blazing sickle carving the night. Laputa's minuscule gravity, even combined with the small amount of centrifugal force that came with being just beyond geosynchronous orbit, barely kept my feet on the polished rock floor. Fetterman's and Ishakawa's people were laughing and congratulating themselves: Ishikawa's people wearing the long, loose suit coats thought to resemble samurai robes, Fetterman's with the string ties, silver and turquoise favored by their boss.

I pulled myself along the guide ropes to my room. Then I called Sphinx to make a full report.

"Our clients are pleased with the way you disposed of the issue. A trial would have been inconvenient and embarrassing for all. Even a nonclient has communicated his government's gratitude. Not only is their representative avenged, but they have a recording almost ninety minutes long with sobbing, then gasping as the air begins to run out, and finally screams as friction incinerates the murderer. They have sent it all over the internet, *pour encourager les autres.* Well done, Angelo."

"Except," I said carefully, "that I did nothing. Zin's fall was accidental."

"Of course, Angelo." Sphinx was almost purring. "I did not mean to impugn your professionalism. Around you, only accidents."

I stepped back into the hallway. At an elevated table at the far end of the hall, the signing ceremony had been completed. As Zin had foreseen, China had signed by video from Beijing. Now the various dignitaries, basking in the attention of reporters' cameras, were making their speeches. The words bounced off the stone walls.

". . . a new age," the speaker said, "starting with a blank slate, free from the shadows of a dead past . . ."

Singh was suddenly beside me. "You knew," I said.

"I suspected. When they were leaving the dining area, his hand dropped to the base of her back and then slid lower. She stiffened, almost flinched away, but then pressed closer to his side. That told me all I needed to know about the relationship. When I heard how he was murdered, I was almost sure she had done it. Even as my own daughter would have, were I not there to protect her."

Applause echoed through the hall as the speaker finished. "Always the future," Singh said. "Always the promise of a completely fresh start, as if we do not carry our sins with us. Faulkner knew better. The past is not dead. It is not even the past." ■

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The Bookseller of Bastet

John G. Hemry

Some heroes are not what people usually imagine, but face no less danger.

The bookshop of Aaron D'abu filled to overflowing a ground level store space in the oldest building in Fraternity, the oldest city on the continent of Libertus on the world of Bastet. The bookshop had been there as long as the building and the city, its narrow street frontage only hinting at the deep space within, lined on both sides with shelves packed with every kind of book and magazine. E-readers and e-books in a hundred formats ranging from obsolete to not-quite-new cluttered one side, stacks of printed books filled the other, and in the very back against a wall covered with handbills announcing author readings and book signings rested an ancient Print On Demand console.

"When they founded this city," Aaron D'abu told me, "my grandfather, may his spirit be ever at peace, was told that the new land here needed hands to build and farm, not shops that sold words. He told them they were wrong, that it was words that had built all which humanity knew, and words which had brought us to this world far from the Earth our ancestors called home."

He waved toward the back of the store. "Look. Inside these walls we have the thoughts formed on Earth two or three thousand years ago and the latest imaginings of the newest generation here on Bastet. They rest side by side, for all books are companions to each other. So said my mother, may she also be at peace."

I'd come to Bastet on a diplomatic mission. Earth's children occupy many worlds now, but the mother feels responsibility for her offspring. There are still things the old mother can offer her children, perhaps the latest technology or new techniques for farming or even grants of devices that new worlds find prohibitively expensive to manufacture. It's all only a drop in the bucket, for even Earth can't do much measured against the needs of other worlds, but it

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grants the home world a bit of influence it might otherwise lack. Too little influence, it often seems, as we watch the new worlds make the same mistakes the old world once did.

How was business? I wondered, noticing that only a few locals were browsing among the many offerings in the bookstore.

"Not what it should be..Enough, but no more. Too many say they don't need these books," Aaron told me. "I tell them everything they want to know, someone else has thought or dreamed of, and it's all here for them to see. Would it kill them to learn of such thoughts? But, no, they claim to honor the past but don't care to learn from it because they say the future will be different." He waved a hand again, this time to encompass all around us. "Does this city look different? See here, the thoughts of the old religions, may all honor be to them. Next to them, the new beliefs. Here the words of those who claim no god, and here the words of those whose gods are philosophy or money or power."

I asked him if he had any texts for the Anubans, who had declared themselves the only true children of the religion all Bastet had once shared. "Of course. You see? There with the others. Many say that the words of the Anubans as well as their people should be suppressed, but truth does not fear argument!"

In the cities to the north, I pointed out, bombs were going off as some Anubans fought for an independent state. "I live near Anubans! A nice family who believe themselves chosen, but do not demand that everyone else submit to the same belief. I respect them." Aaron D'abu rummaged among his shelves. "See here. History. Wars and hatred, and for what? We're building a nice world here, for our children."

Did he have children?

"Alas, no. A nephew. He works here sometimes." Aaron sighed and offered me a seat at one of the beat-up tables lined down the middle of the bookstore. "My wife, blessed be her memory, died of the plague in '29. You heard of it? An awful time. My nephew will have this store when I join her. People will always need books."

He chuckled and picked up a small battered disc from the floor. "Look at this! Cast aside and yet it holds someone's story. Some writer's hopes. Look! A romance, I think." He studied the disc doubtfully. "I don't know if I have a reader that fits this anymore. It came from Earth with the first settlers. Do you think the one who wrote this ever dreamed it would travel to the stars and still be read so many years later?" Aaron smiled and carefully placed the possibly unusable disc on a shelf piled high with a variety of other e-books and data holders.

He wasn't worried by the violence? One of the reasons our delegation was here was to try to broker a cease-fire, I explained. A few gestures of tolerance would deny the violent extremes of the Anubans most of their support.

"Blessings on your task," Aaron replied. "Worried? What can I do? I live with wisdom—" He waved at the books again. "—and am surrounded by human foolishness. Why would they hurt me? Who fears words?"

I didn't see Aaron D'abu again for a couple of months, being engaged in fruitless negotiations with the government and those who claimed to represent the Anuban sect. Eventually I returned to Fraternity and stopped by the bookseller again. He greeted me as if we'd just parted yesterday and this time offered refreshment. "It did not go well?"

No, I confessed, neither side wanted to be seen as giving in.

"If my mother were here, she would speak with them. In my mother's time," Aaron confided over a glass of hot, sweet tea, "the mayor of Fraternity was not a humble man. He thought himself wise above all, and criticism angered

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him. One day, his police came to this very shop and pointed to a new book, which mocked the mayor. Take it down, they said, or this shop will be closed."

"'Why should I remove this book?' my mother asked."

"'It is not truthful,' they told her."

"'Should I take down the book next to it, then?' my mother asked, which was a book saying good things about the mayor."

"'No,' they said, 'for that book is truthful.'"

"'But I must,' my mother declared, 'for the second book says the mayor is a fair and wise man, and such a man would not fear the words of those who disagree with him. If the mayor says I must hide such words, then the second book cannot be truthful, either.'"

Aaron D'abu grinned at me. "The mayor's police argued, then called their supervisor, who called her supervisor, and so on. The next day the mayor himself came and sat here, at this very table, and drank tea with my mother. She told him of all this store held and he listened, and then he told his police to leave her alone, because he who does not fear the truth does not fear lies. That was my mother."

He sighed and looked toward the back of the store. "She died there, seven years ago, among the words she treasured, taking inventory. It was as she wanted it. Her body was taken to the Garden of Memory, but her spirit remains here."

Three months after that, occasional bombs were going off in Fraternity. Tensions kept rising, and both sides in the dispute were accusing us from Earth of favoring the other side instead of serving as honest brokers. A family had been massacred in a small town far to the north. Then two families in another town. Fighting began in Tvor City, radical Anubans striking and drawing retaliation against all Anubans, the radicals building support for themselves at the price of their own people's blood and the government hard-liners playing right into their hands.

Wisdom seemed in short supply when I next visited Fraternity and sought out Aaron D'abu. There were fewer people on the street than I remembered, and Aaron seemed saddened. "Some people leave, others hide. They say the war is coming. I once told you of neighbors I had, good people. But they received threats. Death to Anubans. And they left, for their children's sake. I could not blame them."

Had his business suffered?

Aaron sighed heavily. "Business is not even as good as it was. Not like in the old days. People now say they are too busy for books. Too busy to read, while the world gallops toward the abyss! Perhaps the words of others would give them pause, make them think, give them new eyes to see all around them. Or maybe they fear all that and so avoid it."

A sound of thunder rolled by and the shelves filled with books rattled slightly as if in momentary fright. The bookseller gazed out into the street, where a not-too-distant column of smoke could be seen rising over the buildings. "We came to this world, to this continent, to this city, to build things. And now too many just want to destroy what our mothers and fathers built. This will pass. I know it will. My books tell me it will. Another day will come." Aaron grimaced. "My nephew has been drafted. He will fight. When he comes home, he has promised to come work here."

Another few months and even the most optimistic among our delegation had to admit that we'd failed. Bombs were going off daily in cities and the death toll kept rising while both sides refused to compromise. Earth had no power to compel peace or reason, but was now being blamed in part for the ongoing violence, as if we could have somehow stopped what the people of this world seemed determined upon. We would leave and try to see what we

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could accomplish elsewhere.

The decision was reached during a final meeting in Fraternity, so I resolved to say good-bye to Aaron D'abu before our delegation took its flight back to Bastet's spaceport the next morning. I'd finally buy some books from him, to help occupy the long trip to the next world on our schedule. As I walked toward the street on which his shop lay, I heard and felt and saw the explosion that rattled buildings all around me. Once I recovered, I started running, joining a crowd hastening to provide assistance.

The oldest building in Fraternity was no more. Only rubble remained of the structure. From the size and shape of the crater before it, a vehicle loaded with explosives had been detonated in front of the building.

I stumbled to a halt and stared at the devastation. Why?

I must have said the question out loud, because a woman beside me shook her head. "The building belonged to a man who now commands an anti-Anuban militia." She was crying, tears cutting paths through the bomb-birthed dust that had powdered her face. "Not ten minutes ago I came past here and greeted my friend Aaron. Have you ever noticed his bookstore?" I nodded. "All gone," the woman mourned. "Aaron and all he treasured. And for what? Aaron had been threatened by some Anubans. I knew of it. They didn't like some of the books he sold, but Aaron wouldn't take anything off the shelves. But look where they put the bomb! They didn't even care the bookstore was there. They just wanted to destroy the building."

And I truly didn't know at that moment which was worse: that people might deliberately destroy the bookshop of Aaron D'abu because they hated the ideas inside, or that they might heedlessly destroy it because they didn't care about the ideas it held.

"It's a task of great honor, to sell books," Aaron had once told me. "All of life, hope, death, and love is within my walls. It's a great responsibility, you know. We booksellers, we come and go. But the books, the ideas, those remain with us always for those who seek them."

I left Bastet, wishing more people on that world had read the books that Aaron D'abu had once sold. □

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THERE'S A HOLE IN THE BOTTOM OF THE UNIVERSE!

It's perhaps natural to think that our universe should be more or less the same in all directions, once we average out the lumpiness of stars, galaxies, galactic clusters, superclusters, etc. However, there's a growing body of evidence suggesting that this presumption is not true. There is now a strong suspicion that our universe may contain a gaping "hole" located in the constellation Eridanus. This all started several years ago with the observation that there was a pronounced "Cold Spot" in the data from the Wilkinson Microwave Anisotropy Probe (WMAP) that produced space-based measurements of the cosmic microwave background (CMB) left behind about 400,000 years after the Big Bang.

Let's start by reviewing the cosmic microwave background. Shortly after the initial Big Bang, when fast exponential inflation had stopped, our universe settled down to a slower and steadier rate of expansion. As more space became available to hold the energy in it, the universe cooled to a nearly perfect "liquid plasma" saturated with energy, in which quarks and gluons behaved as free particles. As the cooling progressed, the gluons thinned out and the quarks clumped into composite mesons, protons, and neutrons. For some reason that remains obscure, there was a slight excess of protons and electrons over their antimatter equivalents (antiprotons and positrons). During the high-density stages of the early universe, nearly all of the antimatter particles paired off with their matter counterparts to annihilate, leaving behind the surviving matter particles and producing a universe populated almost exclusively by matter. The cooling universe was then a "soup" dominated by free electrons and protons. In this environment, a photon of light, strongly influenced by any encounter with a charged electron or proton, could travel only a short distance without being absorbed or scattered by one of the free charged particles. But as the cooling progressed, the negative electrons and positive protons tended to pair off to make electrically neutral hydrogen atoms. The free charged particles, which easily absorb photons, were replaced by light-transparent neutral atoms. The murky black "soup" of the early universe became crystal clear.

The photons of the early universe had energies characteristic of the light emitted from a hot object (the universe) at a temperature of about 2,900 K. (Here, K means "kelvin" and specifies the absolute temperature in Celsius degrees above absolute zero.) As long as the universe was murky black, these photons were trapped by repeated emission and re-absorption. However, the transformation to a transparent universe released them from this trap, and they became free photons. These liberated photons have been traveling through the universe ever since, and we detect them today as the cosmic microwave background radiation. However, as the universe expands and space itself

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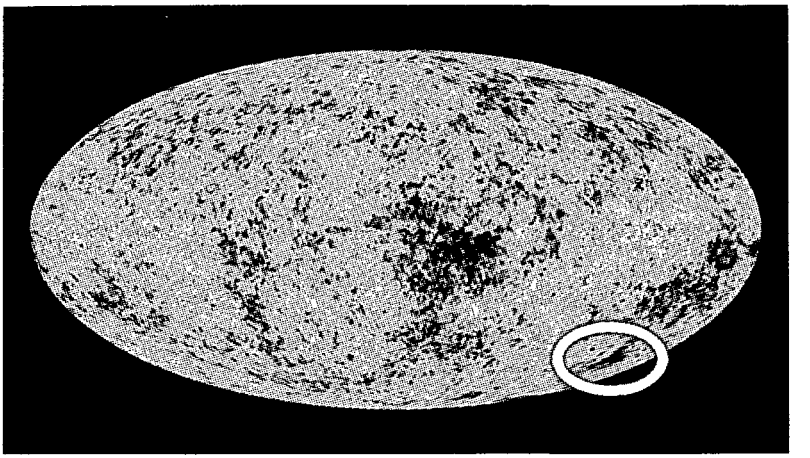

stretches, the wavelengths of these CMB photons also stretch until they are now microwave photons characteristic of a very cold object with a temperature of 2.73 K instead of visible light photons characteristic of a hot object with a temperature of 2,900 K. We observe these CMB photons today as microwaves emitted from a "surface" that has not existed for the last 13 billion years.

There has been a recent flurry of activity to sweep the sky and map the CMB photon intensity vs. angular position on a fine scale. WMAP has produced such a mapping, producing an orange-tinged bluish map that has become well known in science articles and book cover art. In a localized area on the right and well below the map's center there is a particularly cold region, quite dark as compared to the blue, yellow, and orange regions of most of the rest of the map. This region is called the "WMAP Cold Spot," and it lies in the river constellation Eridanus.

When a feature like this is obvious to the naked eye, there is a fairly good chance that it is significant. The question that is raised is whether the Cold Spot is just an expected fluctuation in the intensity of the CMB, or whether it is non-statistical and might be an indication of something particularly interesting going on. The answer is that it is definitely not a simple statistical fluctuation. A group working the Physical Institute of Cantabria in Spain and at Purdue University has carefully analyzed the WMPA data and has concluded that the Cold Spot is not compatible with normal Gaussian fluctuations of the CMB.

Recently two groups, one at the University of Minnesota and the other at Cavendish Labs in England and in Lausanne, Switzerland, have carefully examined the data from the National Radio Astronomy Very Large Array Sky Survey (NVSS), which looked at 82% of the sky visible from the VLA in New Mexico and catalogued more than 1.8 million individual radio sources. The groups studied this extragalactic survey, looking for structure at the Cold Spot location. Both groups have found a sizable dip in source population and radio brightness at just the location of the WMAP Cold Spot.

The implication of these results is that the Cold Spot is not a characteristic of

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the CMB itself, but instead it is a phenomenon that happens as the CMB photons pass through the universe on the way to our detectors. The combined WMAP and NVSS data suggest that along the line of sight to the Cold Spot, there is an enormous volume containing almost no stars, galaxies, or gas. A physical process called the integrated Sachs-Wolfe Effect, the gravitational wavelength shift of photons as they pass through varying gravitational fields in an expanding universe, is probably responsible for the cold spot. As photons of light fall into the gravity well of a massive object like a galactic cluster, they gain energy and are blue-shifted. On emerging from the gravity well, such photons would lose the energy gained, except that, due to the accelerated expansion effect of the large quantity of dark energy in the universe, there is a net repulsion acting and it is a bit easier to get out of the gravity well, so that not all of the gained energy is removed. The net result is that CMP photons that pass through regions containing significant mass arrive at our detectors with a bit more energy on the average than those passing through regions of the universe that are relatively empty. Therefore, the CMB radiation should appear cooler along a line of sight passing through a large "empty" region. In effect, the CMB radiation is weighing the universe along the various lines of sight.

Although sizable empty regions of the universe have been observed before in deep-sky surveys, the region that has produced the Cold Spot appears to be much larger. It appears to be an unusually large "supervoid," perhaps 1,000 times larger than the largest empty regions previously detected. The Cold Spot Supervoid is estimated to be around six to ten billion light years from the Earth, at a red-shift factor of about z=1, and to have a diameter of around one billion light years. It is perhaps worth noting that no computer simulations of the formation and evolution of the universe have ever predicted a void of such a size.

What could cause the Cold Spot Supervoid? I have not seen any speculations in the astrophysics literature as to its origin. The prevailing view seems to be that if it is there, then "it just happened."

However, since this is a science-fiction magazine, let me indulge in a bit of SF related speculation. Some years ago I recall having a discussion about negative mass objects and cosmic voids with my good friend, the late Dr. Robert W. Forward. Bob Forward, for reasons that those familiar with his work will understand, was interested in the possibility that large concentrations of negative mass might exist in the universe. He noted that if there happened to be an object somewhere in the universe, perhaps a natural worm-hole mouth, that had a very large negative mass, then it would tend to repel all of the positive mass in the region, pushing it far away and sweeping out a large empty region in the universe.

Since we now know about the dominant dark energy in the universe, we can now add to Bob Forward's speculation by noting that the integrated Sachs-Wolfe Effect would work backwards for photons that were climbing the gravity "mountain" of a negative mass object (the inverse of a gravity well) and would cool the photons passing through a region dominated by negative mass.

We have learned from general relativity that, given some quantity of negative mass, we could build space-time metrics that allow one to do all sorts of cool SF-related faster than light gymnastics. Therefore, if we need some negative mass to construct wormholes, warp drives, Krasnikov tubes, and so on (see earlier AV columns in this series), there is now a good place to look for it. Just get in your hypervelocity starship and head for the WMAP Cold Spot.

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AV Columns Online: Electronic reprints of about 140 "The Alternate View" columns by John G. Cramer, previously published in *Analog*, are available online at: http://www.npl.washington.edu/av.

References:

The WMAP Cold Spot:

"Detection of non-Gaussian Spot in WMAP," M. Cruz, E. Martinez-Gonzalez, P. Vielva, and L. Cayon, Mon.Not. Roy.Astron.Soc. *356* 29-40 (2005), available online at http://www. arxiv.org/PS_cache/astroph/pdf/0405/0405341v2.pdf

"Extragalactic Radio Sources and the WMAP Cold Spot," L. Rudnick, S. Brown, and L. R. Williams; Astrophysics Journal (2007, to be published); available online at http://www.arxiv.org/pdf/0704.0908.

"Probing dark energy with steerable wavelets through correlation of WMAP and NVSS local morphological measures," J. D. McEwen, Y. Wiaux, M. P. Hobson, P. Vandergheynst, and A. N. Lasenby, 2007, submitted to Mon.Not.Roy.Astron.Soc. available online at http://www.arxiv.org/PS_cache/arxiv/pdf/0704/0704.0626v1.pdf ■

IN TIMES TO COME

Not too many years ago we heard a lot of talk about "nuclear winter": the devastating global climate change that might follow a large-scale nuclear war. That talk largely died out with the collapse of the Soviet Union at the end of the 1980s, but recently a new concern has arisen: what after-effects might we expect from a "small" nuclear war? The question is uncomfortably timely, with the proliferation of unpredictable powers too small to mount a "superpower" type of attack, but unpredictable and quite capable of mayhem on a lesser scale. The consequences are far from negligible, as Richard A. Lovett shows in next month's science fact article on "Nuclear Autumn."

Our April issue will also feature an unusual science-fictional mystery by Thomas R. Dulski, plus a wide variety of entertaining and thought-provoking stories from such writers as Jerry Oltion, Stephen L. Burns, Craig DeLancey, Donald Moffitt, and newcomer William Gleason—and, of course, the climax and finale of Joe Haldeman's novel *Marsbound.*

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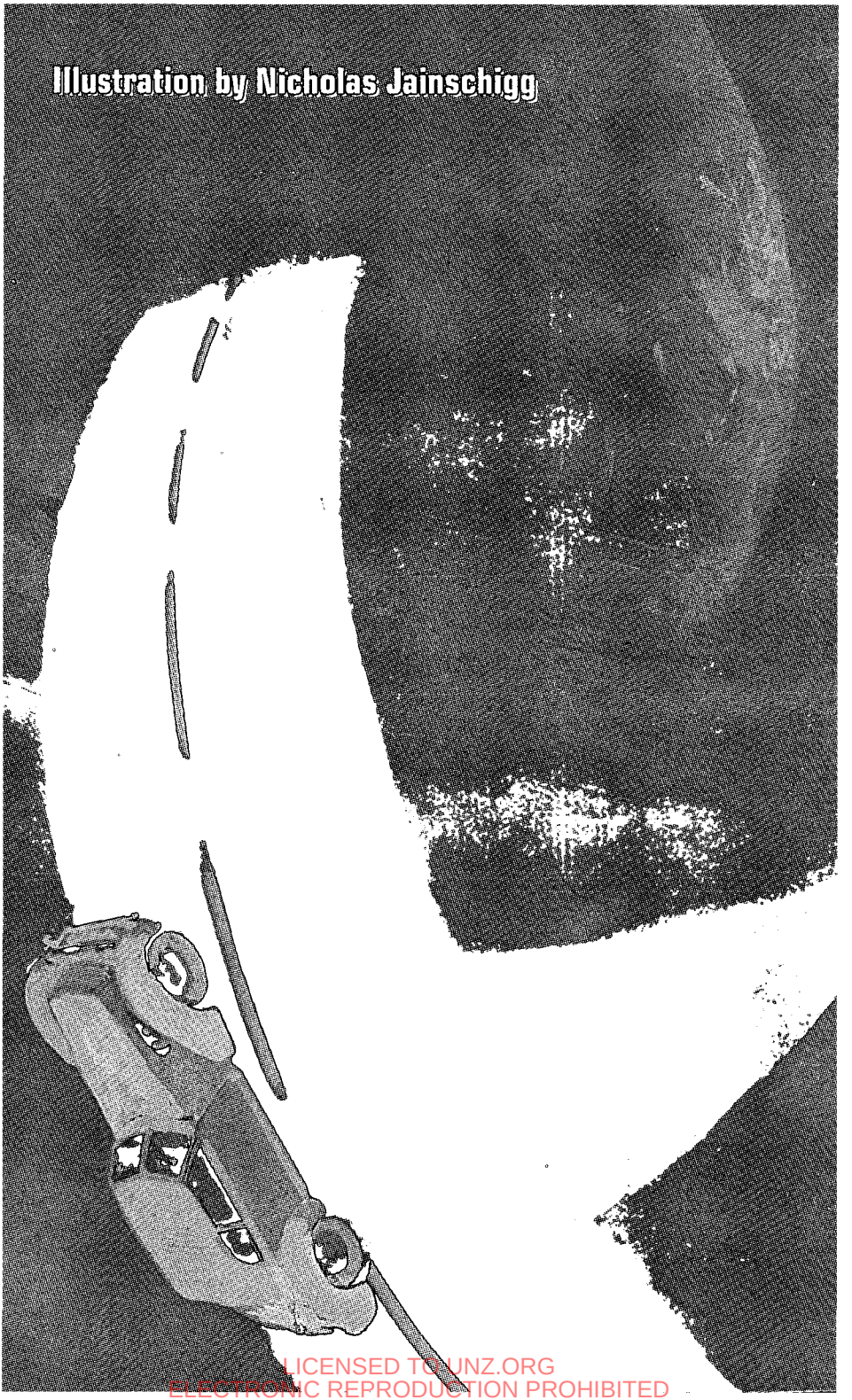

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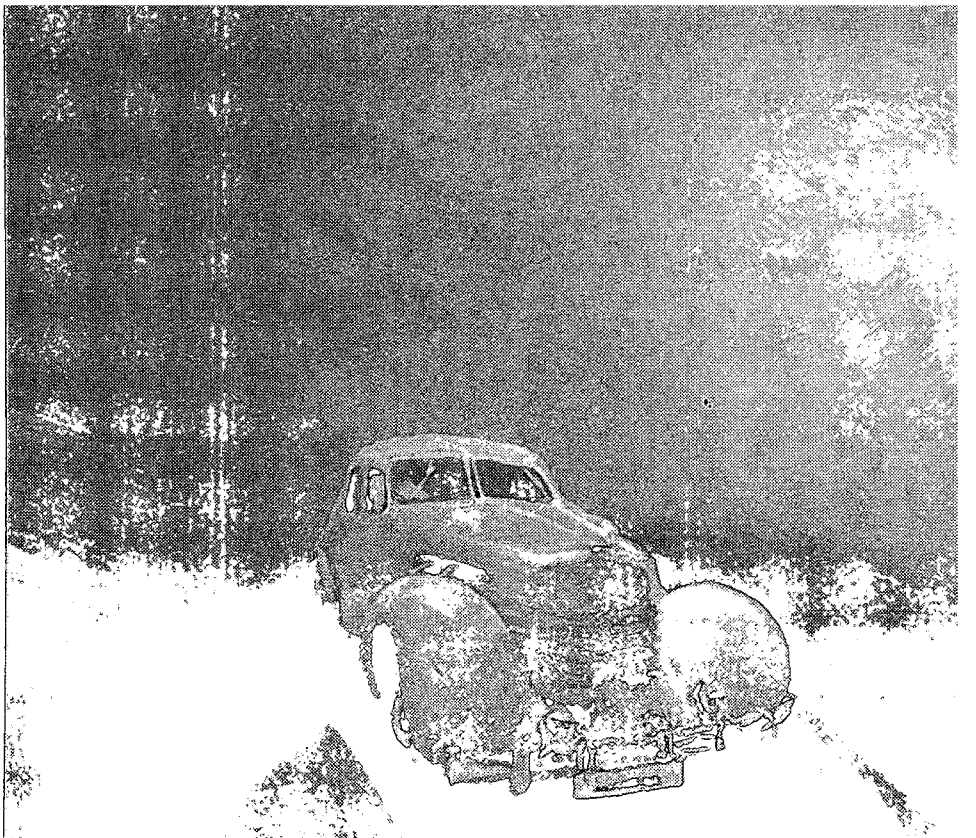

Howard V. Hendrix

Knot Your Grandfather's Knot

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Mike Sakler knew about chaos. In the 1950s his doctoral work in turbulent airflow dynamics eventually led to a job with a major aerospace contractor in Southern California. He'd dabbled in nonlinear dynamics throughout his career, then chaos and complexity theory in the 1980s and '90s. Since his retirement and his wife Ginny's death of lung cancer in 1989, he'd had lots of time for dabbling.

With the kids grown and gone, he sold the family house in Southern California and moved to the central Sierra Nevada near Alder Springs, an hour outside Fresno, among tall pines and old oaks and tree-sized manzanita. He spent his days working and playing on his twenty-acre spread and in his great barrackslike, twelve-thousand-square-foot retirement "party house." Solar powered and off the grid, he built the house with his own hands, out of wood from his own land's trees.

Once the house was up, he found himself playing more than working: tossing horseshoes, bowing his fiddle, strumming his banjo, jamming with young friends, endlessly tinkering with his home sound-studio's electronics.

His fascination with the Cord 810 Beverly was much more than just play or dabbling, however. Mike considered the mothballed green 1936 Cord to be the strange attractor underlying his increasingly chaotic life.

Part of it was personal history. His own grandfather had owned a Cord exactly like the piece of automotive sculpture previously owned by Donald and Rita Batchelder: same make, model, and year. When Mike was twelve and his Grandfather Sakler about the same age as Mike himself now was, the old man took him in that very car to the 1939 World's Fair, for the first of a dozen visits.

The Batchelder Cord had a long and complex history of its own, going back York, years before. Time had pretty much blown the original paint job—a sort of silvery gray-green, like a spruce forest seen at high speed—but that was typical of Cords. Aside from that, the only further damage was the small scratch and dent made by Rita herself in 1955, for which crime Donald had forever after mothballed the car.

So it was that in all other respects the 810 looked the way it did the day it left the factory. The Cord emblem, with its art deco wings, still shining. The eyes of the hidden headlights blissfully sleeping away the years in the big pontoon fenders. The coffin-lid hood fronted by futuristic grillwork—still giving off an impression of blunt velocity, even though the car had been parked and motionless for more than forty years when Mike found it in Rita's garage and had to have it.

Unfortunately, Mike's relationship with Rita didn't continue very long once the sale of the Cord was consummated. What with her calling him a "mercenary, self-centered, heartless old bastard," he couldn't say the affair had ended well.

Still, he reassured himself that, if he wasn't too busy, he could always find another girlfriend through either his martial arts or folk-dancing classes—"ai-ki-do, tae-kwon-do, and do-si-do," as he liked to think of them. He'd been doing all of them for so many years that he'd have black belts in all three if they handed out black belts in folk dance.

Widow Batchelder may have called him heartless, but his heart was fine—or at least as fine as years of exercise, the latest heart meds, and the occasional angioplasty could make it. Oddly, though, he took the fiasco of his breakup with Rita worse than he would have thought. Funneling all his energy into restoring the Cord had the virtue of diverting his attention to what seemed to be more tractable problems, at least at

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smoothing out the dent and scratch, lifting off all the chrome pieces, getting them and the bare steel bumpers all shined up again. He redid the paint job in its original green, and worked on all the detailing that would return the car to absolutely mint condition.

The bodywork went well. Rita claimed her husband had drained the gas and thoroughly changed the oil when he mothballed the car in 1955, so Mike felt his odds of restoring the engine should at least be even, too.

He removed all the plugs and mystery-oiled the holes. The car wouldn't start.

He removed and cleaned the fuel system. It wouldn't start.

He rebuilt the carburetor, did a leak-down test for the rings, and checked the valves. It wouldn't start.

He hooked pulleys to an external electric motor and cranked things around a bit to check the compression. It wouldn't start.

He adjusted what didn't need replacing, brought up the fuel, water, and electrical levels, put the key in the ignition, said a fervent prayer, and still—it wouldn't start.

He would have loved to give up, but he couldn't. When he neglected to work on it, he felt guilty, as if shirking some responsibility he didn't fully understand. He returned to it again and again, often reluctantly.

He put less effort into keeping up his own health. Where before he had been more than willing to "keep active," now he avoided trips down to the valley for martial arts classes and dance performances.

He'd be damned if he'd let the sawbones put him on one of those bland rabbit food diets. He would eat the way he wanted to, thank you. If you couldn't enjoy life while trying to stay alive, you might as well already be dead.

The same was true of his drinking—which, after long hiatus, he took up again in a big way. His young party-people friends kept visiting for a while, some even helping him with his automotive restoration work, but gradually his "drinkering and tinkering" drove them away.

A year and a half into the Cord project, after the endless big failures and small successes, Mike Sakler finally hit bottom.

He drank heavily the first part of the night, then fell asleep. Toward morning, Mike knew he was starting to wake up again when he dreamed he was drunk—and had tied a noose to hang himself.

He had hoped for months and months the drinking would crank up the stage machinery that made the fog in his brain, until it filled the theater of his consciousness, obscuring his memory uniformly. It hadn't worked out that way.

Instead, as the months had passed, his memory had become more and more like the Tule fog that came up out of the ground in the valley below—fog thick yet low, so that it was easier to look straight up through it and see a star shining down out of all those long lost light-years than see the streetlamp just passed a block and a moment before.

The star that shone down on him in his foggiest darkness now was a perfect image of the Perisphere and Trylon, with the Helicline ramping down around them: the "Egg, Spike, and Ramp," the prime symbols of the 1939 World's Fair and its "World of Tomorrow" theme.

That was the future that was—yet never was yet. His childhood attempts with the Build-Your-Own New York World's Fair kits never got much beyond building scale models of the 610-foot-tall Trylon obelisk, its 188-foot-tall Perisphere globe companion, and the Helicline ramp linking them, but that had been all right with him. Those three were what really mattered.

How much Grandpa had loved that fair was a surprise to everyone in the family. Patriarch of a large New York Jewish clan, all the relations thought

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him old-fashioned, with his banjo and fiddle playing, the same instruments he'd taught Mike to play before Mike was ten.

Mike knew his grandfather wasn't old fashioned, though. The old man had been picking up *Amazing This* and *Popular That* at the newsstand for years and sharing them with his precocious, frenetic, problem-child of a grandson.

After that first trip to the Fair, Grandpa was a quiet visionary no more—a result of the same run-in with Yorkville street toughs that had altered the old man's physiognomy, or so some in the family theorized. From whatever cause, in his last two years of life Grandfather Sakler experienced a personal Indian summer, a blaze of fierce, bright, quirky creativity in his closing days. He began keeping a journal and corresponding with world leaders and thinkers, especially Albert Einstein, with whom he met once (by accident) at the Fair and, later, by appointment at Princeton—twice.

Now, amid his deepest fog, Mike remembered the trunkload of Fair memorabilia he inherited from the old man. Rummaging with sudden furious energy through closets and drawers in the eight empty bedrooms and the enormous party room on the top floor of his cavernous house, he found he couldn't remember where he'd stored the trunk.

He staggered down his house's great spiral staircase to the main floor and pillaged more storage spaces. Fear and frustration gnawing at him, he stumbled down one last circuit of the turning stairway. In a spare basement room he finally found it: the musty sealed steamer trunk that was his legacy from an old man dead more than fifty years.

Inside, he found journals and correspondence and other writings, an intriguing but inexplicable device apparently handcrafted by the old man, even a full suit of what appeared to be his grandfather's clothes, smelling slightly of smoke, with fine shoes and shirts and underwear, too, wrapped in a garment bag that had grown brittle with age.

All the Fair memorabilia was still there. The Trylon and Perisphere-adorned orange and blue high-modern Official Souvenir Book. Democracity clocks. Fair plates and puzzles and radios. Heinz pickle pins and a crop of GM-Futurama "I Have Seen The Future" buttons—of which the old man had been particularly fond.

Mike hadn't looked at any of this stuff since the early '50s and had looked at none of it thoroughly at any time. What he remembered, from his previous glances through it, was embarrassment—and fear that, in his final years, his grandfather had become a slightly crazed technobabbler, his notebooks full of inexplicable terms, diagrams, and equations.

What caught his eye now were the photos. In the shots taken before May 1939, the family resemblance that was always there was never so striking as it was in those images taken *after* that first trip to the World's Fair.

He stared at a fading color picture of himself as a boy. Beside him stood a thin, mostly bald man whose remaining hair and beard were a mix of white and gray and yellow—his grandfather, on one of their later trips to the World's Fair, with the Trylon and Perisphere in the distance behind them.

Mike knew his own visage well enough to see how close the resemblance was between the way the old man looked then and the way he himself looked now. It was almost as if the boy had grown up to become his own grandfather.

Grabbing the trunk by both handles, he hauled it upstairs. Its weight forced him to pause and lean against the railings or wall of the stairwell every few feet. When he reached his office, he set the trunk down beside his eight-by-twenty-foot worktable.

Clearing his Cord-related stuff from the workspace, he removed the trunk's

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contents and spread them out over the table's broad top. Up came the suit of clothes and other garments. The sharp leather shoes, too.

Next came all the memorabilia, the flyers, the brochures, the programs. The oxymoronic prose of the captions describing GM's Futurama, "a vast miniature cross section of America as it may conceivably appear two decades hence. . . ."

He sat down slowly in the chair at the worktable. Looking more carefully through the correspondence and the writings again after all these years, Mike thought that the notes now seemed less demented than eerily prescient. Here, paper-clipped to a page of typed notes in a binder, was a letter apparently sent from Einstein himself:

MATTER CAN BE MADE TO "DEGRADE" INTO ENERGY MORE READILY THAN ENERGY CAN BE MADE TO "UPGRADE" INTO MATTER. I DO NOT, HOWEVER, BELIEVE MATTER AND ENERGY ARE JUST TYPES OF INFORMATION, AS YOU HAVE SUGGESTED, OR THAT THERE IS A SPECTRUM LINKING THEM SUCH THAT CONSCIOUSNESS IS JUST A MORE COMPLEX FORM OF INFORMATION THAN MATTER OR ENERGY. NOR DO I BELIEVE THAT CONSCIOUSNESS CAN BE MADE TO "DEGRADE" MORE READILY INTO MATTER AND ENERGY THAN MATTER AND ENERGY CAN BE MADE TO "UPGRADE" INTO CONSCIOUSNESS. ALTHOUGH THE DISTINCTION BETWEEN PAST, PRESENT AND FUTURE IS AN ILLUSION, THE DISTINCTION BETWEEN ENERGY, MATTER, AND CONSCIOUSNESS IS NOT.

Indeed the notes from that page on were most curious. "Planck energy for opening gap in spacetime fabric = 10^{19} billion electron volts," read one, but then that was crossed out with a large X as the writer of the notes took a different tack.

"At each bifurcation point," read the next, "flux occurs in which many potential futures are present. Iteration and amplification mean one future is chosen and others disappear. In bifurcations the past is continually recycled, held timeless in eddies or closed timelike curves, stabilized through feedback. Time is turbulently recurrent, expressing self-similarity across different scales."

After a flurry of equations came an underlined conclusion: "Human nervous system both classical and quantum, exploits quantum scale processes to accomplish macroscale ends—solution lies in phase-locking feedback!"

Mike picked up a page with a meticulously hand-plotted diagram, hauntingly beautiful in its elegant simplicity. When he looked at it more closely, he found the diagram was labeled with questions: "Closed Timelike Rössler Attractor? Temporal Möbius in Phase Space?" Below the question was the note, "Always incompleteness and missing information at the center. The shape of uncertainty shapes certainty."

What pushed Mike back in his chair, however, was how much the "Temporal Möbius in Phase Space" resembled an idealized, abstract image of Perisphere, Trylon, and Helicline. Looking away from the image, he realized that the sun was up, that his head hurt with hangover, and—something else. Bifurcations? Self-similarity? Phase-locking feedback? Phase space? That was the language of chaos theory!

His hand trembled as he flipped through more and more pages of detailed notes, until he reached the inside back cover of the notebook-binder. Taped to it was an ancient envelope, with the words MICHAEL SAKLER written on it. With a shaky hand he pulled the envelope loose from the notebook and opened it.

LETTER TO MYSELF:

IF PROFESSOR EINSTEIN IS RIGHT ABOUT WHAT HE CALLS A "TEMPORAL MÖBIUS" AND I AM RIGHT ABOUT THE ROLE CONSCIOUSNESS PLAYS ON THE INFORMATION SPECTRUM, THEN READING THIS LETTER IS ABOUT TO STOP YOU FROM DRINKING YOURSELF TO SLOW SUICIDE. PERHAPS YOU HAVE BY NOW REALIZED THAT THESE NOTES ARE MEMORIES OF THE FUTURE,

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NOT ONLY MINE IN 1939, BUT ALSO YOURS. IN 1997 YOU HAVE NOT WRITTEN THESE NOTES YET, BUT YOU WILL—IN 1939.

AS A BOY, WE FIRST TRAVELED WITH GRANDFATHER SAKLER TO THE FAIR ON MAY 28, 1939, TO WITNESS THE OPENING OF THE JEWISH PALESTINE PAVILION. ALBERT EINSTEIN SPEAKS THERE, AND THAT DAY YOU—I—MEET HIM FOR THE FIRST TIME. THE OLD MAN WHOM THE BOY RETURNS HOME WITH IS NOT HIS GRANDFATHER. IT IS HIMSELF FROM SIXTY YEARS INTO THAT BOY'S FUTURE.

WHY MUST "WE" GO THROUGH SUCH TEMPORAL ACROBATICS? I'M GLAD I ASKED. IF WE DON'T, OUR GRANDFATHER WILL BE BRUTALLY MURDERED AFTER RUNNING OUT OF GAS IN YORKVILLE ON THE NIGHT OF MAY 28. THE VERY FACT THAT THIS TEMPORAL MÖBIUS EXISTS PROVES THAT POSSIBILITY.

ON ONE TIMELINE, EMBITTERED BY OUR GRANDFATHER'S DEATH, ONE OF THE MANY POSSIBLE "US" DEVOTES HIS LIFE TO INVENTING A TIME-TRAVEL DEVICE AND USES IT TO RETURN TO 1939 TO SAVE OUR ALREADY SEVERELY INJURED GRANDFATHER BY SENDING HIM INTO THE FUTURE. HE—WE—I—REMAIN IN 1939, TAKING OVER THE ROLE OF THAT GRANDFATHER. THE BOY IS SPARED THE SUFFERING AND GRIEF OF SEEING HIS GRANDFATHER DIE FROM HIS INJURIES.

IN CREATING THE DEVICE AND USING IT TO ALTER HIS OWN TIMELINE, HOWEVER, OUR OTHER SELF ON THAT LINE CREATES A TEMPORAL PARADOX. ON THAT TIMELINE, GRANDFATHER SAKLER IS KILLED AND AS A RESULT ONE OF US GROWS UP TO CREATE THE DEVICE THAT WILL ALLOW HIM TO TRAVEL BACK TO 1939 TO PREVENT GRANDFATHER SAKLER'S MURDER. PREVENTING GRANDPA'S MURDER, HOWEVER, MEANS NONE OF US EVER GROWS UP TO BECOME THE MAN WHO INVENTS THE DEVICE TO PREVENT GRANDPA'S MURDER. THEREFORE GRANDFATHER SAKLER IS KILLED AND ONE OF US GROWS UP TO CREATE THE DEVICE THAT WILL ALLOW HIM TO . . . ET CETERA, ET CETERA.

PROFESSOR EINSTEIN TELLS ME THE STRUCTURE OF THE UNIVERSE WILL NOT TOLERATE SUCH AN ENDLESS CONUNDRUM. INSTEAD IT CONSERVES ITS OWN INTEGRITY BY MELDING THE TWO TIMELINES TOGETHER INTO "THE TEMPORAL EQUIVALENT OF A MÖBIUS STRIP"—SOMETHING BOTH AND NEITHER LOOP AND INTERSECTION. ON SUCH A DIMENSION- COLLAPSING MÖBIUS, "EITHER/OR" (EITHER GRANDPA IS SAVED OR THE DEVICE IS CREATED) BECOMES "NOT ONLY/BUT ALSO" (NOT ONLY IS GRANDPA SAVED BUT THE DEVICE IS ALSO CREATED).

WE HAVE, IN SOME SENSE, BEEN "GRANDFATHERED INTO" THIS TEMPORAL LOOPHOLE, BUT AT A COST. THE PRICE OF THIS SHIFT TO "NOT ONLY/BUT ALSO" IS THE ENERGY OF OUR ETERNAL VIGILANCE. IF WE WANT HIS MURDER TO NEVER AGAIN RECUR, WE MUST EVER AGAIN PREVENT ITS RECURRENCE.

I KNOW THIS IS DIFFICULT FOR YOU TO UNDERSTAND AT FIRST, BUT IF YOU CHOOSE TO PERPETUATE THIS RECURRENCE, YOU WILL LEARN THAT TIME TRAVEL IS LESS LIKE RUNNING A PARTICLE ACCELERATOR AND MORE LIKE EXPERIENCING A LUCID DREAM OR PARTICULARLY VIVID MEMORY.

UTILIZING THE CHAOTIC EFFECTS ALWAYS PRESENT IN CONSCIOUSNESS, WE CAN EXPLOIT TIME'S TURBULENT AND STRANGE-ATTRACTIVE PROPERTIES TO BURST THE SURFACE TENSION OF SPACETIME AT FAR, FAR LESS THAN PLANCK ENERGY. I KNOW WE CAN, BECAUSE WE ALREADY HAVE.

FOR US, IT'S NOT ONLY THE DREAM OF THE DOING THAT'S GRANDFATHER TO THE MEMORY OF THE ACCOMPLISHMENT, BUT ALSO THE REVERSE: THE MEMORY OF THE ACCOMPLISHMENT IS GRANDFATHER TO THE DREAM OF THE DOING.

THE DEVICE IN THE STEAMER TRUNK IS ONLY PARTIALLY COMPLETE. I HAVE DONE AS MUCH AS I CAN WITH TECHNOLOGY AVAILABLE BEFORE MID-CENTURY. THE SYSTEM CAN ONLY BE COMPLETED WITH TECHNOLOGY FROM YOUR ERA. I HAVE ENCLOSED A LIST OF WHAT YOU'LL NEED. YOU'LL HAVE TO SEARCH IT OUT AND MAKE IT ALL WORK TOGETHER, IF YOU CHOOSE TO PERPETUATE OUR RESPONSIBILITY IN THIS AND KNOT YOUR GRANDFATHER'S KNOT—*OUR* GRANDFATHER'S KNOT, AND EINSTEIN'S KNOT—IN THAT OLD CORD.

I HOPE YOU WILL DO SO, AND WILL FIND IT BOTH A LOOPHOLE THAT BINDS AND A KNOT THAT FREES, AS I HAVE. AT ALL EVENTS, GOOD LUCK!

—MICHAEL SAKLER

P.S.: THAT CORD'S NO HOT ROD, BUT IT'S CRUCIAL TO THE SET AND SETTING OF THE MENTAL STATE REQUIRED FOR THIS TIME TRAVEL EX-

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PERIENCE. IT ALSO WORKS WELL ENOUGH FOR HAULING BATTERIES AND GETTING AROUND NEW YORK IN 1939, SO TREAT IT KINDLY!

Mike slowly folded the letter. Lost in thought, he stroked his beard absently for a while. *Well, it's better than the other option for a loophole that binds and a knot that frees,* he told himself, remembering his hungover dream of a hangman's noose.

He got up from the table and the chair and stretched. Then he went downstairs, down to the garage/workshop where the Cord sat with its hood up. The sun was shining brightly just beyond the shadows. He got to work.

Focused on that work, Mike's days flew by. A certain balance had returned to his life, too: his obsession was no longer a mad one. He returned, at least sporadically, to his ai-ki-do, tae-kwon-do, do-si-do classes. He sent a card of apology to the widow, who unfortunately was not interested in reestablishing contact. During 1998 and early 1999 he even went to temple a few times—something he hadn't done in years.

Maybe the prayers paid off. In June of 1998, he was able to start and run the Cord's engine for the first time—and the completed restoration cost him less than he'd expected. Such was not the case with completing the "Temporal Möbius Generator," however.

The interface synching his mind up to the machine and capable of inducing the mind-chaos needed for his time trip required state-of-the-art neuro-hookups so expensive he had to take out a second mortgage on his property. They were on the 1939 list, however, so he purchased top-of-the-line units from a "mindware" dealer operating out of a software storefront in a Marin County strip mall.

Using the system he put together, Mike experimented with low voltages to create a map of his own mind's functioning. Taking as his guide the 1939 notes—with their jargon of "ekstasis points," "temporal dissipation vortices," and "eschaton particles"—he located regions of his brain that, when stimulated, produced both "out of body experience" and vivid strange-attractor memories of the World's Fair. These, the notes indicated, were vital to the temporal voyage he was to undertake.

By May of 1999 all was in final readiness. A couple of days before his planned time jaunt, he took the now operational and fully equipped Cord on one lengthy test drive—but only one.

That test drive in itself narrowly missed becoming a disaster. Driving the Cord down to the Valley to see his doctor for his routine physical, he felt fine and the car was running fine, but he still almost didn't make it. Pulling off of Herndon Avenue and into the rat's maze of private medical offices surrounding St. Agnes Hospital, he blanked out at the wheel. Only in the last second did he catch himself—and catch the hard left turn he very nearly missed.

When he finally pulled into a parking spot, he was both shaken and relieved. He had narrowly escaped smashing into the cinder-block wall separating the parking lot of his doctor's building from the hospital's parking lot.

Well, he reminded himself as he walked to his appointment, if I'd smashed through the wall, at least I would have practically landed in the emergency room!

The only sign of Mike's brush with Fate was a slightly elevated pulse rate. No trace of a mini-stroke or any other brain glitch that might explain his blanking out just moments earlier. His doctor declared him to be in fine shape, outside of the pulse spike—especially considering his cholesterol and his plaqued arteries and everything else the doctor deigned to lecture him on.

Given Mike's failure to change his diet to save his ticker, the doctor warned him that he would have to remain absolutely faithful in taking his heart pills

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and would likely still need to have surgery within the year to remove his blood mud. Mike agreed politely but planned on changing nothing because, two days later, he was ready to go.

Into his winged chariot's trunk Mike loaded the big Exide storage batteries that had, until then, provided electrical storage for the solar panels atop the roof of his off-the-grid party house. Despite the fact that his house would soon be going dark, he was in a celebratory mood.

He decided to dress appropriately for the occasion. From the closet in his office Mike removed the full suit of clothes and shoes he'd taken from the trunk so long before and tried them on. All the clothes fit perfectly, as he somehow knew they would.

He looked at himself in the mirror, a man of not inconsiderable years, dressed in a dark suit and tie of a rather conservative cut, topped by a snap-brim hat. Yes, just what the well-dressed time traveler would be wearing in 1939.

He locked up his home. Walking toward the Cord in the driveway, he twice glanced back wistfully toward his huge handmade house. Starting up the Cord, he drove it through evening light along a deserted forest service gravel road until it passed directly beneath the hydroelectric powerlines, where he stopped.

Rigging up a coupling and converter, he linked power from an overhead line to the battery array in the trunk. From the system of dams and turbines on the upper San Joaquin River, he swiped enough of that "clean, safe Democracity energy" to bring the device and the storage batteries up to maximum.

As he decoupled his power tap, he doubted the power company would much notice. A little free juice was the least they owed him, after he'd put up with this power line eyesore all these years.

The fully restored Cord spun gravel on the last stretch of switchbacks before fishtailing up onto the blacktop of Alder Springs Road. Einstein had once contended that imagination was more important than knowledge. At this moment, Mike felt like a living embodiment of that premise.

No machine alone could do what he was going to do. The chaos of brain, the individuality of mind, the singularity of memory: all were indispensable to the reality of travel in time.

Over the blacktop he drove to the summit of the ridge, then stopped the Cord. Its engine thrummed along placidly, idling, as he watched the sun go down. Slowly, the rim of the turning world obscured the light of day. Soon the first stars began to come out.

Mike took off his hat and put on his temples the circlets containing the neuro-hookups. Checking everything one last time, he threw the switches to activate the timers and all the memory systems of all the computers on board, revved the engine as high as it would go, put the Cord in gear, then took his foot off the brake.

He was overcome by a euphoric sensation of floating upward, not unlike what he had sometimes experienced just as he drifted off to sleep and the bed beneath him seemed to fall away. This time, however, there was no hard jerk of ordinary consciousness striking to reassert control.

This time he just kept drifting, a full-blown out-of-body experience bringing his body and the car with it. Faintly he heard the engine sounds breaking up, digitizing, becoming discrete, then wildly dilated, then sounding almost as if they were being played backward.

Through the windshield and windows he saw a fog rising—a type of Bose condensate. Mike seemed to have seen it before: thick yet low, the Tule fog of memory.

He looked up through the windshield and saw a star perched atop a great curving skybridge, like a diamond ring effect seen during a total eclipse of the sun.

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The bridge was a vast, slightly rainbow-shimmering catenary Möbius curve. From this angle, it looked rather like the St. Louis Gateway Arch, only countless miles high—and it wasn't so much "in" the sky as it somehow *was* the sky.

The Cord was moving in and through the skybridge, in the ultimate daredevil stunt loop. His own memories ran like cords of fog through the suspended and suspending bridge and tunnel. Particular events in his life possessed their own unique gravity, curving and warping his memoryspace in ways he could not have foretold—

—until the fogbridge did its Möbius fillip and he sat outside the 1939 World's Fair, in sunshine, in the Cord, in the parking lot that would one day become Shea Stadium. Through the windshield he saw the Trylon and Perisphere surrounded by the whole of the Fair, a candied confection of the Future to be consumed by the present.

Too often, for him, black and white was the past, while the future was color. Yet here he was, in the past—and in color. Putting on his hat as he stepped out of the car, Mike was a man inside his own dream.

Might as well enjoy myself, he thought. He grabbed a frankfurter with everything at Swift & Company's streamlined super-airliner building, then some ice cream over by Sealtest's triple shark-finned edifice. He paid for them with the antique liberty coins the notes had suggested he bring.

Strolling about the fairgrounds, he saw again how wind-shaped so many of the structures appeared. Buildings that looked as if they'd been designed in wind tunnels. Frank R. Paul mélanges of fins and keels and flanges. Spirals, helices, and domes, their towers topped with zeppelin-mast spires. An airstream wonderland, waiting for the inevitable arrival of Northrop flying wings and Bel Geddes teardrop cars.

Stopping at the base of the Trylon and examining it closely, Mike rediscovered the Fair's secret. Like everything else, the Trylon was intended to look smoothly mass produced, machine precise, and slipstream slick. Up close, however, he saw that its surface was rough, stuccoed with all the "smoothness" of jesso over burlap. Beneath its assembly-line dreams of aerodynamic cowls and zero-drag farings, the great exhibition felt handcrafted—a prototype of the shape of things to come, not a production model.

The future is best viewed from a distance, Mike thought as he approached the Chrysler Motors Building in the Transportation Zone. Remembering its "Rocketport" display, he went inside.

Where he literally bumped into Albert Einstein.

"Pardon me, Professor," Mike said quickly.

"Not a problem, not a problem," the Nobel laureate said with a distracted smile, turning back to lean on a railing. Together they watched the Rocketgun simulate another blastoff into tomorrow, with full noise and light special effects.

"They'll probably use it for shooting atomic bombs at each other," Mike remarked, "long before they use it for passengers."

Einstein gave him a startled look, then smiled wryly and shrugged.

This was the hard part. The only way Mike had been able to come up with to get the great man's attention was the way Klaatu had gotten Professor Barnhart's attention in *The Day The Earth Stood Still.* Mike couldn't remember how fluent Einstein's English was, but he pressed on quickly nonetheless.

"I know you've been working on unified field theory," Mike said, pulling a folded sheaf of papers and a card from his coat pocket, "so I thought you might be interested in this."

Unfolding the papers, Mike presented the sheaf to the professor. On the pages he had diagrammed, with explanatory captions, a particularly interesting vari-

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ant of what would someday be called the Einstein-Podolsky-Rosen theorem.

Einstein glanced at the pages, perfunctorily at first, just humoring him. Then the physicist's eyes grew wide as he realized the importance of what he was looking at.

"Wo—Where—?"

"I knew you'd see their merit," Mike said, gesturing toward the thin sheaf, then handing Einstein the card with his grandfather's name, address, and phone number. "It's been a pleasure meeting you in person, Professor. I can be reached at this address. Let's keep in touch."

"Ja—er, yes!" Einstein said, shuffling papers and card about in his hands so he could shake the hand Mike offered him. Tipping his hat and turning before he melted away into the crowd, Mike was pleased he'd made his Einstein contact already.

Deciding to treat himself to as much of the Fair as possible before he made his way to the Jewish Palestine Pavilion, he toured the Town of Tomorrow. Then it was on to the Immortal Well and its streamlined Time Capsule, scheduled to be opened in 6939 A.D. Next he saw the robots Elektro the Moto-Man and his Moto-Dog, Sparko, perform in the Westinghouse Building.

He felt a childlike awe at General Electric's ten-million-volt indoor lightning-bolt show, and Consolidated Edison's block-long "City of Light" diorama. The line for the GM Futurama was far too long, however. His rendezvous with that tech triumph could wait for another visit.

He made his way through what felt more and more like a planetary county fair, until he at last reached the Jewish Palestine Pavilion. During the day the numbers of spectators for the pavilion's official opening ceremonies had swelled past fifty thousand. On the fringes of the crowd, entrepreneurs sold Jewish Palestine flags, as well as armbands and yarmulkes adorned with the Star of David.

Recalling that his grandfather—though neither Orthodox nor Conservative—had on a lark bought such a yarmulke at the World's Fair today and all those years ago, Mike now bought one as well and put it on, in hope and remembrance.

In his accented English, Einstein himself at last pronounced the words, "I am here entrusted with the high privilege of officially dedicating the building which my Palestine brethren have erected." Amid the vast, cheering crowd, Mike despaired of finding the old man and boy he was seeking, but he kept looking.

By the time the ceremonies ended, Mike still hadn't found the boy and the old man he sought—not even after the crowd broke up.

Worry, frustration, and anxiety warred within him as he drifted like a lost ghost through the great squares and avenues of the Fair, alongside the Lagoon of Nations, past the pavilions of states and governments. He wandered beneath the closing fireworks, his hope fading like blown starshells. He came to the reflecting pool beneath the Perisphere, at just the moment the great voice of that globe began to sound its eerie tocsin over the emptying fair.

With other stragglers he made his way toward the parking lots, panic rising in his mind. He'd lost them somewhere in the Fair! They were no longer on the grounds anywhere! He banged his forehead with palmed fists. How to find them? How to find them?

Getting into the Cord, he sat and stared through the windshield. He felt forlorn and powerless as a lost child. Not even the play of faerie lights over the Trylon and Perisphere could alter his despondent mood. He leaned his head against the steering wheel and mourned inconsolably.

Yorkville.

The word drifted into his consciousness like a boon from a merciful god. Yes! New York's German-American sec-

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tion, where his grandfather had had his run-in with the street gangsters. It was only a hunch, but as he left the parking lot for the streets he could think of nowhere else to go.

He had maps, but the maps were not the city. He got lost, again and again. By memory he had successfully navigated across sixty years of time and thousands of miles of space, but now he was having difficulty finding his way around New York City!

When at last he made his way into Yorkville, streets and landmarks began to take on the faintest aura of déjà-vu familiarity. He began to remember. They'd run out of gas, yes. He had waited in the car while his grandfather had gone to fill up the gas can. His grandfather had been gone a long time—

At the far edge of a streetlight, in a vacant lot, Mike saw and heard it, before he was ready for it. Four young men yelling, *"Jude! Unflätiger Jude! Verderber! Teufeljude!"* as they pummeled and kicked an old man.

Mike skidded to a stop beside the nightmare tableau and got out of the car.

At the sound of the Cord screeching to a halt, the young men stopped their heavy-booted work. Hearing the car door opening and slamming, one of the men, the smallest, took to his heels. The other three stood their ground, fists clenched.

Mike walked steadily across the lot toward them. When he was perhaps fifteen feet away, one of the three abruptly broke away toward something off to one side—a gasoline can. Mike saw the youth take matches and handkerchief rag from his pockets. He knew immediately what the boy intended to do.

While the fire maker fumbled about his work, Mike in battle-dance kata waded into the remaining two, punching and kicking.

An elderly avenging angel, he felt strangely detached, as if in a minor trance. His only barely-conscious thought was an odd little mantra—ai-ki-do, tae-kwon-do, do-si-do, again and again.

He knew he took many blows and strikes, but he gave far more, stomping insteps, roundhouse kicking ribs, smashing noses, snapping collarbones, shattering kneecaps. Even Yorkville street toughs had never encountered such a fighting style. They fled at last, but they had done their damage.

His grandfather, doused about the neck and chest with a slosh of gasoline, was going up in slow immolation. It was all Mike could do to put out the fire with his suit coat. The old man's pulse was thready, but the pain of his burns roused him to consciousness.

"Thank you," he whispered, coughing blood.

"Grandpa," Mike said, cradling the old man's head, "it's me, Michael."

"Michael?" asked his grandfather, confused. "How?"

"I know—I'm old," Mike said, picking his grandfather up awkwardly in a fireman's carry. He headed toward the Cord, heart pounding, talking all the while, adrenalin-delirious, trying to explain. "I know it doesn't seem to make sense. But listen, you've got to believe me. I'm sending you into the future. You'll die of your wounds and burns here. I've come from the future to help you. Having you to save saves me, both as the boy I was, and the old man I'll be."

Mike opened the passenger side door of the Cord and propped his grandfather in the seat. Dazedly his grandfather watched him. Taking Grandpa Sakler's keys and money clip, Mike tossed his own wallet onto the seat beside his grandfather.

"All the ID you'll need to pass for me in 1999 is in that wallet and in the car," Mike told him. His grandfather nodded weakly, or perhaps he passed out. Coming around past the back of the car, Mike opened up the driver's side door. Slotting his own key on its key chain into the Cord's ignition, he started the

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car and turned on the temporal Möbius generator.

The car was equipped with enough computer power for a full memory of his trip here, as per the notes he had written, the notes he would write. Now, though, he would have to change its return destination.

Putting on the neuro-hookups, he fast-reversed the memory guidance record to a bifurcation point two days before he left 1999—to his last trip to the doctor's office near St. Agnes Hospital, for his physical.

This time, the Cord would miss the turn, and not miss the cinder-block retaining wall. He remembered all he could, then imagined the car through wall and total smashup, into the hospital parking lot—right in front of Emergency, where an old-fashioned man with a secret desire to see the future would finally get his wish.

Turning to his unconscious grandfather, he kissed the old man lightly atop his bloodied head.

"I love you, Grandpa."

He stood on the brake, revving the engine while in gear. At the same instant he flipped the Möbius generator's last switch, dropped his foot off the brake, and threw himself from the car, the circlets tearing free of his head.

Around him he felt the chill of death. He was every place and no place at all, every time and no time, and he was falling. . . .

He landed heavily on his hip. Around him a thin mist dissipated as a breeze blew along the street. He propped himself up on his forearm, feeling old and very tired. Something had happened to his memory. His recall of the last several hours was as hazy as a dream or nightmare dissolving on waking.

"Grandpa?" A boy's voice said, coming toward him. The boy peered into his face with evident concern. "Grandpa, is that you? You don't look right. Are you okay?"

"Just tripped and fell down, is all," Mike said, getting slowly to his feet. At last he began remembering something of the role he was supposed to play.

"Grandpa? Where's the gas can?"

For a moment Mike had no idea what the boy was talking about. The boy looked around.

"Oh, here it is," the boy said, running to pick it up from the vacant lot, then coming back, still looking at Mike. "Here. Your yarmulke fell off too."

"I'm a bit discomboobalated from the fall, is all," Mike said, trying painfully to smile and joke as he took the yarmulke with its Star of David from the boy's hand. "Thank you. Lead the way back to the car. I'll follow you."

The short walk returned Mike partway to his senses. His chest hurt. He realized that, here in 1939, without medications or surgical techniques yet to be invented, he would not live very long.

So be it. Until he died he would lead a very full life. Here, in this time when the future was beautiful and distant as Heaven, he would spend his remaining days remembering—and planning.

"Hey, Grandpa!" the boy called when he'd reached his grandfather's Cord automobile. "Gimme the keys."

"What?" Mike said. He looked quizzically at the kid as he took the gas can from the boy. The can was still close to half full. Pouring its remaining contents into the fuel tank, he hoped it would be enough to restart the car.

"You know," the boy said. "Lemme drive."

"No, no," Mike said, waving his hand in a light gesture of dismissal. He put the empty gas can in the trunk, then opened the doors to let them both in. He slipped the key into the ignition and looked at the smiling boy sitting on the other side of the front seat.

"You may just be driving this road, too, someday," the old man said quietly. "Maybe sooner than you think."

After a time, the engine caught and they drove away. ■

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Helen's Last Will

James C. Glass

In future legal proceedings, the first crucial question may be, "Who goes there?"

The lobby of Advanced Technologies was steel struts and white polymer panels reaching toward a high vaulted ceiling of clear glass. The receptionist and an armed guard sat in a glass-enclosed booth on an otherwise vast but empty floor of black marble. Both looked up as Blanche approached the booth.

"May I help you, madam?" asked the receptionist, a blond, pretty man in his twenties.

"I wish to see the body of my sister," said Blanche. "She was interred here last Thursday."

The young man smiled, fingers poised over a keyboard. "Name?"

"Helen Charlston Winslow. Age eighty-four. I believe the arrangements were made by Arthur Winslow, her son. It was all quite sudden, and I wasn't notified."

"Are you a relative?"

"Her sister, Blanche Charlston Packard." Blanche sniffed and slid her national identity card under a partially opened window in the booth. The man looked at it, then at something on his computer screen.

"Helen Winslow, yes. She was brought here directly from her home. Arthur Winslow attended her admission to verify identity."

Blanche managed a sob. "I talked to her personal physician, and he didn't even know she'd been ill. I'm wondering why he wasn't called in or at least notified when she died."

The man gave her a sympathetic smile. "We have a staff of twenty physicians, madam. Three attended your sister and pronounced her dead at twenty forty-five. Cause of death was a massive cerebral hemorrhage." He turned back to his computer screen and studied it.

"Your sister had a long-term contract with us. Everything was done according to her specifications."

"Yes, of course. I knew she was an investor in your firm. When may I view her body?"

The young man's eyes wandered from hers. "Ah—that won't be possible. There are no viewings here. The clients are placed in sealed tanks. Decanting them for viewing would involve considerable expense. The tissue cannot be allowed

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to warm above liquid nitrogen temperature once it's quick-frozen."

Blanche's manner changed abruptly. "Save that for the believers, young man. I want to see my sister's remains, and I want to see them *now.*"

The guard in the booth shifted his feet uneasily, and the receptionist forced a smile.

"I understand, Ms. Packard, I really do, but it isn't possible, and there are no exceptions. It's in the contract. The remains can be removed only for advanced medical treatment when there is a high probability for success, as determined by our physicians. There's so little to see, anyway. Your sister's contract allowed only her head to be preserved. The rest of her body has been designated for research purposes."

Blanche put a hand on the window, as if to ward off an evil spirit. "You decapitated my sister?" she asked softly.

"It's quite common, Ms. Packard. The expense for preserving the head is a fifth of that for the entire body. Over half our clients choose this option. The others have specific medical problems they wish to have solved when the technology is available in the future. It would seem your sister didn't have such a problem."

"Only a massive cerebral hemorrhage," said Blanche. "All right, I want to speak to one or more of the physicians who attended my sister and find out what's going on here. This entire thing smells foul to me."

"If you leave your number, someone will call you and hopefully explain things better than I have."

Blanche gave him her card. "It had better be tonight, or we'll be talking about this in a court of law."

"I'll forward this card right away and tell them your concerns," said the receptionist.

Blanche turned her back on him and marched away fuming, swinging her arms. She was dressed expensively in white pantsuit and black tie and looked important. She was a handsome woman, looking perhaps fifty, even forty, yet she had recently turned seventy-six. She pulled out her cell phone and spoke a number. Waited, one foot tapping the floor.

"Arthur Winslow, please," she said, and waited again, then, "Arthur, this is Blanche. I'm here at Advanced Technologies, and I've just been told I can't see my sister because you've had her decapitated. Now what are you up to, you miserable little worm?"

She waited a moment, then punched the phone off in a fury.

Arthur had hung up on her.

"There's a conspiracy here, Randal, and I expect you to unravel it."

Randal Haug, Blanche's expensive attorney and longtime friend of her late husband Ralph, leaned over his expansive desk to study the document there and thumped it with a finger.

"Nothing," he said. "Not one red cent. The last version I saw had you down for over two million in stocks and property alone. What happened between you and Helen?"

Blanche's fingers twisted together in her lap. "I don't know. We saw a lot of each other until a few years ago. I think it started when Fred died. Helen was a recluse for months after that, but Arthur was there to comfort her. Dear Arthur, her baby boy. Fred didn't leave him a dime; it all went to Helen. Even then, she designated a portion of the estate to me; we'd talked about establishing a foundation to support local performing arts. I know Arthur opposed that. I heard him say so. The man is a financier, an accountant. He exists solely in his left brain."

"You think Arthur has manipulated his mother into changing her will?"

"I do."

"For what purpose? The bulk of the estate was left to him in the older version of the will, and he's an independently wealthy man without it. You don't need the money. Ralph left you, what, twenty-five million? Fifty? I can't recall now."

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Blanche's voice rose in pitch. "It's not the money, Randal. Not money for me, that is, but Helen and I had a foundation planned, and suddenly I'll have to do it alone while that son of hers puts all *her* money back into the company that has mutilated her for no reason. Cost, indeed! My sister would *never* have allowed her head to be removed and her body destroyed just to save a measly hundred thousand each year. They say it's in her contract, then tell me I can't see the thing to verify it. There's something sinister about this, Randal, and I want you to get to the bottom of it! I'm thinking of filing a wrongful death suit against both the company and Arthur Winslow. Murder would be harder to prove."

"You're not serious," said Randal.

"I have inside sources. As of last Tuesday, Arthur owns twenty percent of Advanced Technologies. The buy he made Tuesday had to come from his inheritance; my sources can list the stocks he traded. We can link them to Helen's holdings. We have a motive, Randal. The method is harder to prove."

Randal seemed suddenly interested and drummed the fingers of his right hand on the desktop, then pointed at Blanche and said, "I can write that in a way to force a show cause hearing before a judge. But if I get one, will you accept the judgment? If it goes against you, will you drop all of this? Helen was also my friend, Blanche, and I think she'd be very unhappy with me for dragging her son into court. Arthur has always struck me as being smart and hard working. I don't think he'd do what you're suggesting here. He could just be making what he considers to be a wise investment with his inheritance. You have no physical evidence for anything else."

"You're not being supportive, Randal," said Blanche softly. "You've been my lawyer for years, but that can end right now."

Randal didn't even flinch. "It *will* end right now if you don't answer my question. Will you accept any judgment of a show cause hearing? If not, then find yourself another lawyer."

Blanche glared at him. She did not like being pressured by hired help, but she needed the man. "If I'm convinced my sister wasn't murdered, I'll not press for anything beyond the judgment of a hearing," she said.

"Good," said Randal, then closed the file on his desk and gently hammered on it with a fist. "Let's go to court."

The call came late at night when Blanche was preparing for bed. The kitchen help had left for the night, and Paula had retired to her basement bedroom after leaving a warm brandy and a cookie on the nightstand for her mistress. So when the telephone rang, Blanche picked it up quickly so Paula would not be awakened.

It was Arthur Winslow.

"I was served with a summons this afternoon. Wrongful death? Have you totally lost your mind?"

"It's only a hearing, Arthur," said Blanche. "There are questions to be answered before I proceed with further litigation."

"For what? This is all about mom's will, isn't it? All the money you have, and you're greedy for more. That's why mom cut you out of it in the first place. You don't *need* more!"

"It isn't about money," said Blanche. "My sister died under mysterious circumstances, and I want them explained."

"You're nuts! Paranoid! Do you know what this hearing can do to my business if it gets into the papers?"

"That's nonsense. I'm just trying to—"

"You've always been a greedy bitch. Mom told me so. You were always after her to finance your social butterfly events, even when Dad was alive. He went along with it. Well, I don't. You badgered mom for money when she was alive, and now you're doing it when she's dead. Finance your own social status, and leave us alone!"

The cell phone clicked in Blanche's ear.

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"That's not fair," she said, but Arthur was gone.

A show cause hearing was held in the court of Judge James Maxwell on a Friday. A team of lawyers from the firm of Abercrombie, Nels and Faber represented both Advanced Technologies and Arthur Winslow. They requested a private hearing in judge's chambers. Randal Haug opposed the request, arguing that the public had a right to know about the operations of the company. Judge Maxwell compromised when Advanced Technologies rebutted by saying that in order to adequately defend themselves it might be necessary to reveal company proprietary information related to pending patents.

The hearing was held in court, but was closed to all but participants on that Friday. Arthur arrived in financier's uniform, his pudgy, soft body encased in a finely tailored woolen suit that made him indistinguishable from his lawyers. They sat behind one table, Blanche and Randal behind another, facing the bench. There was a bailiff, court reporter, and physicians who could be called as witnesses. They all arose when Judge Maxwell entered court in the matter of Packard vs. Winslow and Industrial Technologies re: the Wrongful Death of Helen Winslow.

Maxwell was in his fifties, respected by his peers, and known as a no-nonsense judge who got right to the point without theatrics. "This is a hearing, not a trial," he told them. "I don't want to hear objections or attempts to withhold evidence. I *do* want to hear reasons why this issue should, or should not, go to trial, and I am confidant we can accomplish all of this today. Mister Haug, it's your serve."

Randal smiled and arose chuckling at the judge's reference to his devotion to tennis. His opposition sat glumly silent.

Haug outlined his case: the mysterious death, an unseen contract, the bizarre beheading and storage of a client with only a son's knowledge of what was happening, and that son a major investor in Advanced Technologies, Incorporated. He demanded proof that all had been done according to the wishes of Helen Charlston Winslow, that she had indeed been dead before decapitation, and that an autopsy be ordered to prove cerebral hemorrhage as the cause of death.

Arthur Winslow stared straight ahead and never made direct eye contact with Blanche. The spokesman for the legal team at his table, a wiry, little man named Richard Camus, described Arthur as a loving son whose mother had died in his arms, a devoted son who made sure her every wish was carried out by rushing her to a laboratory for preservation and hopeful rejuvenation in the future. Helen Winslow herself had had a long-term interest in their work, contributing considerable funds for the development of new technologies in the freezing and rejuvenation processes.

"Your Honor, we doubt that a loving son would allow his mother's body to be mutilated if he wanted her to be rejuvenated in the future," said Randal Haug.

"The head was the relevant part of the body in question, and there was considerable cost savings in preservation," rebutted Camus for the defense.

Haug snorted rudely. "The woman had a cerebral hemorrhage, we're told. It seems the rest of her body was fine, and you have disposed of that part of her when she could easily afford the cost. I don't accept that, and neither will a jury."

"It was all in her contract," said Camus.

"Then let's see it," returned Haug.

There was a long silence. Camus whispered to his colleagues, and Arthur leaned over to listen, frowning.

"As written, contracts with our clients include company confidential information on procedures, and the medical conditions they're applied to. Patents pending approval can be put at risk by public exposure, but the client approves each step of the procedure, and company-sen-

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sitive information must be included in the contract."

Judge Maxwell smiled and looked at Haug.

"Then let's go to trial so I can subpoena the contract and any other admissible documents I need for my case," said Haug. "Your Honor, this is a possible felony case. I have the right to know if legal procedures were followed during and after the death of Helen Winslow, and if those procedures were indeed according to her will."

Judge Maxwell folded his hands in front of him and looked down at Richard Camus. "The contract is admissible, counselor. Your patents are applied for and protected under patent law. Why the resistance?"

"I've just explained that, Your Honor," said Camus.

"I see. Well, let me explain something to you. I'm a simple man who likes simple solutions to problems. I've studied the briefs you gentlemen have submitted on behalf of your clients. The mystery is clear enough to justify further investigation at the least, and it seems to me we could learn a lot by having a look at that contract. We can learn even more by ordering the autopsy requested by Counselor Haug in his brief. Now, if I see nothing to substantiate a claim of wrongful death, there's no reason to move forward with a long and expensive trial. We could all be home in time for lunch, so to speak. Showing us the contract makes a lot of sense, counselor. What do you think?"

"I don't want to set a new precedent, Your Honor," said Camus. Arthur was pulling at the man's sleeve, whispering something.

"No precedents to be set, counselor. This is a hearing. We're seeking evidence to justify a trial."

Haug and Blanche had been hastily conferring, and Blanche nodded her head.

"Your Honor," said Haug, "my client will not pursue a request for an autopsy and will drop her charges if she's satisfied with the contents of her sister's contract with Advanced Technologies."

Arthur and his attorneys conferred again, and there was obvious disagreement. Arthur slapped his hand on the table to emphasize a point. Finally, Camus cleared his throat and said, "We did not come prepared to show the contract, Your Honor, but we can have copies brought here if it's absolutely necessary. We feel it's in the interest of all parties to avoid the expense and publicity of a trial."

Judge Maxwell checked his watch. "It's nearly ten. We will resume at one. I expect Counselor Haug will have at least an hour to study the contract and formulate his questions. One way or another, I hope we're going to settle this today." He smiled down on them all. "Coffee time," he said, and banged his gavel lightly.

"No wonder they didn't want us to see it," said Blanche. "This is not only outrageous, but obscene. Helen would never have agreed to this."

"You agree that's her signature?"

"Yes, it looks like it. Signatures can be forged, Randal."

"I doubt it here, Blanche. I think you'll have to accept that Helen was involved as a subject for experimentation with Advanced Technologies before her death, and what's happening now is an extension of that work."

"*What* work?"

"Good question. Whatever it is has to be approved by Arthur Winslow, but otherwise, 'my body can be used in any form or for any purpose within the AINI project.' That's both vague and specific. We have to find out what AINI means. It's the only unknown. Otherwise, Helen has allowed them to do anything they want with her after her death."

"Then they brainwashed her to get her money. This AINI thing is probably part of it."

"We can still argue for an autopsy," said Randal, "but my bet is she died the

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way they said she did. And seeing the contract hasn't strengthened our case, Blanche; it's weakened it. They've documented Helen's total consent to the procedure. All we can do is try to show that consent was somehow forced out of her."

They were sitting on a bench outside the courtroom. Arthur came down the hall with his entourage behind him, and Blanche glared at him.

Arthur broke away from the group. Camus made a grab for his arm but missed. Arthur headed straight for Blanche. Randal stood up, prepared to defend her, but Arthur stopped short. His round face was flushed, and he posed angrily, hands on hips. Blanche had a sudden urge to laugh at him.

"Well, I suppose you're *still* not satisfied," said Arthur.

"We might be, if you tell us what the AINI project is," said Randal.

"That's none of your business."

"It might be if it involves coercion and fraud. Let's see what the judge thinks."

"Monster," said Blanche, "you've been allowing experiments with the body of your own mother."

"You don't know *anything,"* shouted Arthur. "Mother would be furious if she heard you say that!"

Camus arrived and pulled Arthur back. "You won't accomplish anything by this. They don't have a case," he said.

"We'll see," said Randal.

Blanche smiled, pleased by Arthur's boyish rage. "You always got away with tantrums when you didn't get your way, dear. If you'd been mine, I wouldn't have allowed it."

"How fortunate you weren't able to have children," snarled Arthur.

"Arthur, *please!"* Camus pulled him away backward by both arms.

"No! This has to stop here. I'm going to have my AINI unit brought in for testimony. It'll settle everything once and for all."

"The patents, Arthur. We can't—"

"The patents are filed, and the hearing is closed. If anything leaks to the press we'll sue her for everything she has. Let me go!" Arthur twisted in Camus' grip and broke it.

"Wait for me here. I need to make a private call." Arthur turned to Blanche and pointed a shaking finger at her. "*Now* you're going to get it!"

Everyone was amazed as Arthur stormed away from them. For one instant, Randal Haug and Richard Camus were sympathetic colleagues. Randal shrugged his shoulders in dismay, and Camus said, "What can I do? The funding was his, and he has the authority. The board, of course, will blame me."

Randal shook his head sadly. Blanche was mystified by everything she's just heard.

Two hours later, she understood everything.

"What's all this?" asked Judge Maxwell, after he'd seated himself. He gestured at a large black screen and computer console with projection system that had been set up along one wall of the courtroom. Two fish-eye cameras mounted on the console pointed outward into the room.

"My client wishes to perform a demonstration he feels will clear up this entire matter, Your Honor," said Camus.

"Any objections to this, Counselor Haug?"

"No, Your Honor. The only questions we have regarding the contract relate to details about the AINI project, and we're told the demonstration will answer those questions."

"Good. You may proceed, Counselor Camus."

"Ah, the demonstration will be given by Arthur Winslow. He's familiar with the technology and has been using it on a regular basis since his mother's death."

Maxwell looked at Haug.

"No problem, Your Honor."

Arthur stood up, adjusted the knot on his tie, and walked to the computer, turned, cleared his throat, and folded his

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hands together over his stomach.

"The apparatus behind me houses what we call the AINI Model 10. By AINI we mean 'Artificially Intelligent Neural Integration.' It is basically a combination of a brain that stores data and a learning center that can synthesize new data from old. In other words, it's an artificial intelligence system with a solid state brain made up of rare-earth impregnated carbon nanotubes."

Arthur opened two doors at the base of the console, revealing what looked like a solid cube of silver metal. "This is the brain."

Everyone looked at him blankly, searching for understanding and relevance. "Rubbish," muttered Blanche, and Arthur heard her.

He glared straight at her, closed the console doors behind him and softly said, "It's my mother's brain, now, and if you'll listen I'll tell you how that happened."

Blanche gasped. Randal squeezed her arm and hushed her.

Arthur blushed, and his voice quavered. "It all started with the Josephson Junction SQUID arrays to map magnetic storms in the brains of epileptics, but as resolution increased, our scientists began to see repeated neural current patterns related to specific thoughts, especially in memory recollection. We were soon down to the neuron level in resolution. Each memory, each thought, is a definite, three-dimensional current pattern in real time. It's like scanning a picture, and this is what AINI does, building up a library of memories and thoughts than can be reassembled by an AI system to satisfy any scenario."

Arthur's voice cracked. He seemed to be struggling and took out a handkerchief to wipe his forehead. His eyes were suddenly quite moist.

"It was my mother who came up with the idea of using AINI to store more than the body of someone you loved when they died."

Arthur choked, cleared his throat again, and blew his nose with the handkerchief. Blanche rolled her eyes and sighed.

"She was interested in many things, and she'd had a series of small strokes, little blackouts that frightened her. We were so close. She heard about the freezing process at Advanced Technologies. If something bad happened, we wanted to have hope. Medicine is advancing fast, and then the people at Advanced Tech told us about AINI. They were looking for human subjects for testing. And Mother volunteered her time and her money."

Arthur took two steps toward Blanche and pointed a finger at her. "While *you* were flitting around with your elite social functions, my mother was making major contributions to both science and technology. She funded the entire project and spent nearly five years of nights and many days under the SQUID array cap, having the neural currents of her own brain mapped and deciphered. She was still doing it the day she—she—"

Arthur paused and breathed deeply, wiped his eyes with the handkerchief.

"This is sick," mumbled Blanche, too loudly.

Arthur gave her a look that promised pain and suffering. "Why don't we just let Mother tell you about it herself," he said softly.

"Randal, how long do we have to hear this?" said Blanche.

"Your Honor," began Randal, "I would like to—"

"I was about to give a demonstration relevant to this hearing, and I have the court's permission to do it," said Arthur.

"Then do it," said Judge Maxwell. "I don't think we need more background information at this time."

"This is company proprietary information, Your Honor," said Camus, suddenly standing as Arthur walked back to the apparatus. "We must have a guarantee the details of the demonstration will not go in any form beyond this room."

"This hearing is closed, ladies and gen-

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tlemen. *Any* information given here, including this demonstration, stays here. Any information leak will prejudice all future litigation and be cause for breach of privacy. Are we clear on this?"

Everyone nodded in agreement. "Yes, Your Honor," chorused Randal and Camus.

There was a sudden hum that quickly faded. Arthur sat at the keyboard, fingers playing over the keys. He looked like an organ player sitting there, but this organ had a monitor in front of him, and a wide black screen stretched like a sail on top of it, between two fish-eye cameras. A ball of light had begun to glow, not *on* the screen but in front of it. Before their eyes a three-dimensional view of a room appeared. The walls of the room were white, the floor carpeted in crimson. There was a sofa and two chairs in red leather, a glass coffee table with a vase of red roses in the foreground. Three shaggy weavings in a rainbow of colors hung on the walls.

There was an open doorway in the back of the room. Someone walked past it. A man. Blanche felt her heart skip a beat. Only a glimpse, but the face had seemed familiar.

And then a woman appeared. She was tall, draped in a red silken robe, her gray hair stylishly coifed in swirls framing her face. She could have been fifty or thirty. She walked like a model, posture erect and defiant, went to the sofa, sat down, crossed her legs, and smiled.

Blanche gasped. "Dear God, it's Helen, the way she looked years ago," she whispered to Randal.

The woman seemed to look right at her. "Well, they say you should pick an age you like and stick with it. Hello again, Blanche. From that frown on your face I'd say we're still fighting. Are we?"

The voice was deep and husky, a voice Blanche had been jealous of for over sixty years. Men had been attracted to it like bears to honey. Blanche's mouth moved, but nothing came out.

"No? Well that's not what I hear." The woman's eyes moved. "Hi, sweetie. I guess this is court, huh?"

"Yes, Mother," said Arthur.

Judge Maxwell was smiling and seemed fascinated by the display. "Perhaps you should introduce us to your—ah—demonstration," he said.

Arthur blushed crimson and seemed embarrassed by the request. "I'm not quite sure what I—"

"Never mind, dear. I'm quite capable of introducing myself," said the woman's floating image. "Officially I'm AINI, but some of the techs like to pervert it by calling me Annie. It's cute, but inaccurate. In every way, you see, I'm Helen Winslow, based on me the person, but synthesized and evolved into my present form by the AINI system. I'd prefer you call me Helen, because that's who I am, but I'll accept Annie if you like."

"But you are an artificial intelligence system," said Maxwell.

"Everyone in this courtroom functions like an AI, Your Honor. We store and retrieve memories, we think and learn and synthesize new ideas from old. The only difference between you and me is our computers. Yours is organic, incredibly compact, but slow. Mine is larger but very fast."

"Do you know why you've been brought to this courtroom?"

"I think so. Arthur was rather upset when he tried to explain it to me."

The woman's gaze shifted to Blanche and made eye contact. "I'd be upset, too, if someone tried to charge me with murder."

"This is a hearing, and no formal charges have been filed against anyone, Ms.—ah—" Maxwell paused.

The apparition laughed, a deep-throated laugh that Blanche remembered well. It had turned men's heads at gatherings large and small for years, without promising anything but her presence. "*You* don't know what to *call* me," she said. "If you say Helen, you acknowledge my transfiguration and oh, my goodness, what a precedent that would set!"

She laughed again. Maxwell grinned.

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"Call me Annie, then, but remember who I really am when you hear what I have to say. This whole mess is partly my fault, anyway, and I intend to clean it up."

"Very well—Annie," said Maxwell, and turned to look at several anxiously waiting people in the room. "We're open for questions, gentlemen. Counselor Haug, would you like to begin?"

"Randal, this is absurd," whispered Blanche, as Randal stood up.

"Are we to consider this—Annie as a viable witness, Your Honor?" asked Randal.

"You wanted to know about the AINI system," said Maxwell, eyes twinkling in amusement. "Well, here she is."

"I really don't think a machine can be—"

"This will go nowhere, Your Honor," said Annie. "I never could talk sense to lawyers, even you, Randal, and it won't be any different now. This is all between two sisters, anyway. It's all about the money, and everything else is smoke. Talk to me, Blanche. We can settle this in a few minutes, if you'll let it happen."

"I doubt that very much," said Arthur, who frowned at Blanche.

"Now Arthur," said Annie, "you promised me you'd go along with whatever I agreed to today. No pouting. Just do what Mother says. Sit down with your lawyers and let me handle this."

"I will not talk with this—this *thing,*" said Blanche.

"Your Honor, this is a sham," said Randal Haug. "Mister Winslow has obviously programmed the machine for this performance, and I must—"

"May I *please* be allowed to do something useful here?" said Annie. As she said it, a man appeared in the doorway behind her and said something softly. He wore a white bathrobe and had a toothbrush in one hand. Annie turned and said quite audibly, "Later, hon. I'm just getting warmed up here." The man looked disappointed and went away from view.

Blanche's face flushed hotly. The man was Fred, Helen's late husband, only he looked to be in his forties or early fifties. The shock of recognition must have shown on her face, for the apparition called Annie smiled at her.

"He's such a dear, but so impatient, and I have a lot of fleshing out to do on him. So many of my memories are from when he was sick. You remember how hard that was, don't you, Blanche?"

"Yes," said Blanche, and caught herself. "I mean—"

"I know, I know," said Annie. "It's all so real for me, but not for you. It seems like yesterday I was old, and my joints were hurting, and I kept having these little blackouts, and then I can remember Arthur bending over me, screaming hysterically, and then—well, then there was nothing. No tunnel of light, no angels for old Helen. I was just suddenly here, still old at first, but no pain, and everything I thought, everything I remembered and wanted from the past—it just happened, when I wanted it to. Of course I also remembered all the downloading; my God, I wore that brain-sucking cap of theirs to bed for over five years! But there was no way I could really predict what it would be like until I got here."

Annie's eyes glistened wetly. "It was lonely here at first. Believe it or not, Tickle, I missed you. I knew you were mad at me, and I didn't make it up to you before I left. I'm sorry."

Blanche felt something catch in her throat. She hadn't been called Tickle since the age of seven. It even softened her heart for one instant, and then she turned it into stone again. "You've been doing some research, Arthur," she said. "It's not going to work with me."

Arthur lunged from his chair, but Camus grabbed him around the chest and held him tightly.

"Stop it, Arthur! If you want to speak to me again, you'll sit right down and be quiet. Tantrums are not excusable for a man your age. Do you want me to be ashamed?"

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Arthur sat down as if struck. A tear rolled down one cheek.

Annie glared at Blanche. "You always *were* good at goading people, but you were a coward when it came to standing up to me, so don't try it. Yes, I want to convince you I'm what's left of Helen; I'm most of her, in fact, if you take away the physical form. I could spend hours reciting things only you and I would know, like the time you bit me when I wouldn't let you play with my dolls. We didn't even tell Mother about that. And then there was the time I caught you and your weird friend Ellen doing some interesting things with the little Waltham boy in our garage. I bet the details of that would perk things up in this hearing."

"You wouldn't dare!" shouted Blanche, standing and shaking a fist.

"I *would* dare, but I won't, so sit down, Blanche," said Annie. She stood up, stepped forward, and leaned over, as if peering into a camera lens. "It would be fun to watch you squirm again. Without me around, I bet you've been running roughshod over everyone. Want to hear something funny? I'm enjoying myself right now. I've missed our fights; they're stimulating.

Blanche's eyes filled with tears. "I haven't missed them at all. I haven't missed *you* at all."

"Oh, that was supposed to hurt, but it didn't. You miss me plenty, Tickle. Sisters know. It's one of the reasons you're so angry. Wow, the memories are still coming. I bet I could synthesize a somewhat younger version of you, and we could fight all the time right in my living room. Fred wouldn't mind. He got used to it a long time—"

"Ladies, ladies, *please!*" said Judge Maxwell. "There are important questions to be answered here, and you're not answering them."

Maxwell wasn't smiling this time. Blanche wondered if he saw through the sham of what Arthur was doing with his machine, the way his creature was making her look like a vicious old fool. Her hands were shaking. It was just like her fights with Helen over all those years. So real, so real . . .

"Question one," said Maxwell. "How did Helen Winslow die?"

"A blackout, like I said, only this one brought me here. I'm told there was massive bleeding in my brain," said Annie. She sat down on her couch again and crossed her legs.

"All right. Question two: why was Helen's head preserved by freezing and the rest of her body separated from it?"

Annie thought for a moment. "Well, I remember it said in the contract my body could be used in any way to help the AINI project. Only the head was important, really; there was some data downloaded right after I—I should say Helen—died. Helen's last image of Arthur was there. Oh, I'm sorry, sweetie. I have to be Annie to answer the questions, but you know who I am."

Arthur was crying, his face buried in a handkerchief.

"Separating Helen's body wasn't a cost-saving measure?"

"Well, it saved money, but the body was worthless, all used up, nothing left to revive. No matter, now. I'm here, and I have my Fred, my Arthur. We talk whenever we want to, don't we, hon?"

Tears were running down Arthur's cheeks. He nodded his head, smiled, and blew his nose loudly in the handkerchief.

"He keeps us right in his living room," added Annie. "It was worth the extra cost, but there's where I got into trouble with Blanche. I never thought she's miss a couple of million; she always had more than Fred and I. I just got overenthused about the project, I guess. I was wrong. I was wrong because I promised Blanche the money for her foundation. But then the blackouts started, and Arthur was so upset and alone, and we—we just wanted to be together, at least until he finds that special girl."

Arthur began blubbering again. Everyone in the room avoided eye contact with each other.

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"Dear God," said Blanche.

Annie bristled. "Oh shut up, Blanche. I don't expect you to understand, but there is nothing stronger than the love of a mother for her only son. You never had children because you didn't want them. I did, so try to respect that."

Her voice had risen in pitch. Her male companion came into the room, walked up behind her, and put his hands on her shoulders, squeezing gently. "The ice is melting. I miss you." He kissed the crown of her head.

Annie put her hands on his and pointed directly at Blanche. "See anyone there you recognize?"

The man looked closely. There was no doubt in Blanche's mind that she was looking at an image of Fred Winslow from at least thirty years before he'd died.

"Is that Blanche? How did she get to be so old?"

Again that husky laugh. "I'll explain later, sweet. Pull the cork. I'll be there in a minute. Kiss, kiss."

He kissed Annie delicately on the mouth and went away.

Annie gave Blanche a sultry look. "More upgrades coming, but he's already quite a man. I've kept him waiting long enough, so let's get to it, Blanche. I'm Helen whether you like it or not, but I'm also a damn good AI. The judge here isn't going to help us. There are too many precedents involved: legality of AI testimony, the AI as a legal substitute for a human, dead *or* alive, et cetera, et cetera. I don't think he cares to appear in the legal journals that many times. Is that an accurate statement, Your Honor?"

"That is a reasonable approximation of what I'm thinking," said Maxwell, looking vaguely amused.

"So it's you and me, Blanche. How much will it take for you to drop all this mess? Two million? Three? How about four? That's tops. Otherwise you're going to trial, and there isn't a jury around that's smart enough or imaginative enough to believe I am who I say I am. And you will get nothing."

Blanche looked at Arthur. "I'll write a check for whatever amount Mother says and make it payable to your arts foundation in the names of my parents," he said.

Randal shrugged his shoulders and wiggled an eyebrow at her. The rest of the lawyers at the other table looked away. There was a long silence, horrible for everyone who waited.

"Three million," said Blanche.

"Write the check, Arthur," said Annie, standing up and smoothing her robed hips with her hands. "I'll talk to you tonight. Right now I have a date with your dad. Blanche, do come over for tea sometime. We must stay in touch, and Arthur will set up the machine for you, won't you dear?"

Arthur nodded numbly, not obviously pleased with the request.

"We should talk more often, and I'd really like to see how your foundation plays out. It's good for me to keep up a variety of interests, now that I have so much time. Promise you'll come soon?"

Blanche moved her lips, but could not bring herself to answer.

"Bye, then," Annie said, and left the room. Arthur turned off the machine and the white room with red furnishings was gone. Annie was gone—and so was Helen.

"Let the record show the parties settled this matter out of court," said Maxwell, looking pleased and relieved. "This hearing is ended."

Everyone filed out of the courtroom. Arthur waited for Blanche at the door. "You'll have the check in a day or two," he said, then, "You know, Mother was really serious about visiting with you. Just give me some warning when you want to come over. I don't have to be home. My secretary knows how to boot AINI for her."

Blanche looked away from him. "I really don't think I'll be doing that, Arthur," she said.

Later, she changed her mind. ■

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Marsbound

part II of III

Joe Haldeman

If Mars does have inhabitants, they won't be your grandfather's Martians. . . .

Part I synopsis

Going to Mars sounded like an exciting trip to eighteen-year-old ***Carmen Dula****, but once she got there, the brave new world started to resemble a crowded tenement, where you couldn't go outside without supervision; one misstep and you'd die in seconds.*

On the six-month-long trip over from Earth, she'd had a tryst with the pilot, which put him in some trouble with Mars, and her in deep *trouble with at least one person there: the administrator* ***Dargo Solingen****, who seemed to make Carmen her special project, monitoring her schoolwork and spying on her personal life, keeping her on unlovely work details.*

Dargo really exploded when she caught Carmen in a midnight skinny-dip in the newly filled water tank, along with her brother and four other young people. Worse than immoral! She couldn't claim they were doing anything other than paddling around, but water was scarce and almost sacred.

Among the punishments Carmen had to endure was total imprisonment inside the underground colony—no Mars walks until further notice. She took it for a day and most of a sleepless night. At three in the morning, she tiptoed up to the airlock, disabled the alarm, suited up, and went outside into the Martian dark.

She took a "dog" along, a wagon that carried extra oxygen, water, and power, and decided to walk straight out four thousand steps, and then straight back. Farther than she'd ever been, but not completely unexplored territory.

She enjoyed being alone, for the first time in more than a year, and paced along very carefully—until the crust she was walking on grew thin, and she fell through, dropping through the darkness to the hard floor of a lava tube. She broke an ankle and a rib. She did find the dog and turned on its light, and plugged into its oxygen supply.

But the radio was useless, and she realized she was getting cold. The suit heater was broken. How long before she froze solid?

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As her hands and feet grew numb, she lay and looked up at the hole she'd fallen through. In what she thought was a final hallucination, an angel floated down. He was wearing red, and was incredibly ugly.

II. FIRST CONTACT

1. Guardian angel

I woke up in some pain, ankle throbbing and hands and feet burning. I was lying on a huge inflated pillow. The air was thick and muggy and it was dark. A yellow light was bobbing toward me, growing brighter. I heard lots of feet.

It was a flashlight, or rather a lightstick like you wear, and the person holding it . . . wasn't a person. It was the red angel from my dream.

Maybe I was still dreaming. I was naked, which sometimes happens in my dreams. The dog was sitting a few feet away. My broken ankle was splinted between two pieces of what felt like wood. On Mars?

This angel had too many legs, like four, sticking out from under the red tunic thing. His head, if that's what it was, looked like a potato that had gone really bad. Soft and wrinkled and covered with eyes. Maybe they *were* eyes, lots of them, or antennae. He was almost as big as a small horse. He seemed to have two regular-sized arms and two little ones. For an angel, he smelled a lot like tuna fish.

I should have been terrified, naked in front of this monster, but he definitely was the one who had saved me from freezing to death. Or he was dressed like that one.

"Are you real?" I said. "Or am I still dreaming, or dead?"

He made some kind of noise, sort of like a bullfrog with teeth chattering. Then he whistled and the lights came on, dim but enough to see around. The unreality of it made me dizzy.

I was taking it far too calmly, maybe because I couldn't think of a thing to do. Either I was in the middle of some complicated dream, or this is what happens to you after you die, or I was completely insane, or, least likely of all, I'd been rescued by a Martian.

But a Martian wouldn't breathe oxygen, not this thick. He wouldn't have wood for making splints. Though this one might know something about ankles, having so many of them.

"You don't speak English, do you?"

He responded with a long speech that sounded kind of threatening. Maybe it was about food animals not being allowed to talk.

I was in a circular room, a little too small for both me and Big Red, with a round wall that seemed to be several layers of plastic sheeting. He had come in through slits in the plastic. The polished stone floor was warm. The high ceiling looked like the floor, but there were four bluish lights embedded in it, that looked like cheap plastic decorations.

It felt like a hospital room, and maybe it was one. The pillow was big enough for one like him to lie down on it.

On a stone pedestal over by the dog was a pitcher and a glass made of something that looked like obsidian. He poured me a glass of something and brought it over.

His hand, also potato-brown, had four long fingers without nails, and lots of little joints. The fingers were all the same length and it looked like any one of them could be the thumb. The small hands were miniature versions of the big ones.

The stuff in the glass didn't smell like anything and tasted like water, so I drank it down in a couple of greedy gulps.

He took the glass back and refilled it. When he handed it to me, he pointed into it with a small hand, and said, "Ar." Sort of like a pirate.

I pointed and said, "Water?" He answered with a sound like "war," with a lot of extra R's.

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He set down the glass and brought me a plate with something that looked remarkably like a mushroom. No, thanks. I read that story.

(For a mad moment I wondered whether that could be it—I *had* eaten, or ingested, something that caused all this, and it was one big dope dream. But the pain was too real.)

He picked the thing up delicately and a mouth opened up in his neck, broad black teeth set in grisly red. He took a small nibble and replaced it on the plate. I shook my head no, though that could mean yes in Martian. Or some mortal insult.

How long could I go without eating? A week, I supposed, but my stomach growled at the thought.

He heard the growling and pointed helpfully to a hole in the floor. That took care of one question, but not quite yet, pal. We've hardly been introduced, and I don't even let my *brother* watch me do that.

I touched my chest and said "Carmen." Then I pointed at his chest, if that's what it was.

He touched his chest and said "Harn." Well, that was a start.

"No." I took his hand—dry, raspy skin—and brought it over to touch my chest. "Car-men," I said slowly. Me Jane, you Tarzan. Or Mr. Potato Head.

"Harn," he repeated, which wasn't a bad Carmen if you couldn't pronounce C or M. Then he took my hand gently and placed it between his two small arms and made a sputtering sound no human could do, at least with the mouth. He let go, but I kept my hand there and said, "Red. I'll call you Red."

"Reh," he said, and repeated it. It gave me a shiver. I was communicating with an alien. Someone put up a plaque! But he turned abruptly and left.

I took advantage of being alone and hopped over to the hole and used it, not as easy as that sounds. I needed to find something to use as a crutch. This wasn't exactly Wal-Mart, though. I drank some water and hopped back to the pillow and flopped down.

My hands and feet hurt a little less. They were red, like bad sunburn, which I supposed was the first stage of frostbite. I could have lost some fingers and toes—not that it would matter much to me, with lungs full of ice.

I looked around. Was I inside of Mars or was this some kind of a spaceship? You wouldn't make a spaceship out of stone. We had to be underground, but this stone didn't look at all like the petrified lava of the colony's tunnel. And it was warm, which had to be electrical or something. The lights and plastic sheets looked pretty high-tech, but everything else was kind of basic—a hole in the floor? (I hoped it wasn't somebody else's ceiling!)

I mentally reviewed why there can't be higher forms of life on Mars, least of all technological life: No artifacts—we've mapped every inch of it, and anything that looked artificial turned out to be natural. Of course there's nothing to breathe, though I seemed to be breathing. Same thing with water. And temperature.

There are plenty of microscopic organisms living underground, but how could they evolve into big bozos like Red? What is there on Mars for a big animal to eat? Rocks?

Red was coming back with his lightstick, followed by someone only half his size, wearing bright lime green. Smoother skin, like a more fresh potato. I decided she was female and called her Green. Just for the time being; I might have it backwards. They had seen me naked, but I hadn't seen them—and wasn't eager to, actually. They were scary enough this way.

Green was carrying a plastic bag with things inside that clicked softly together. She set the bag down carefully and exchanged a few noises with Red.

First she took out a dish that looked like pottery, and from a plastic bag shook out something that looked like an

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herb, or pot. It started smoking immediately, and she thrust it toward me. I sniffed it; it was pleasant, like mint or menthol. She made a gesture with her two small hands, a kind of shooing motion, that I interpreted to mean, "breathe more deeply," and I did.

She took the dish away and brought two transparent disks, like big lenses, out of the bag and handed one to me. While I held it, she pressed the other one against my forehead, then chest, then the side of my leg. She gently lifted up the foot with the broken ankle and pressed it against the sole. Then she did the other foot. She put the lenses back in her bag and stood motionless, staring at me like a doctor or scientist.

I thought, okay, this is where the alien sticks a tube up your ass, but she must have left her tube back at the office.

She and Red conferred for a while, making gestures with their small arms while they made noises like porpoises and machinery. Then she reached into the bag and pulled out a small metal tube, which caused me to cringe away, but she gave it a snap with her wrist and it ratcheted out to about six feet long. She mimicked using it as a cane, which looked really strange, like a spider missing four legs, and handed it to me, saying "Harn."

Guess that was my name now. The stick felt lighter than aluminum, but when I used it to lever myself up, it was rigid and strong.

She reached into her bag of tricks and brought out a thing like her tunic, somewhat thicker and softer and colored gray. There was a hole in it for my head, but no sleeves or other complications. I put it on gratefully and draped it around so I could use the stick. It was agreeably warm.

Red stepped ahead and, with a rippling gesture of all four hands, indicated, "Follow me." I did, with Green coming behind me.

It was a strange sensation, going through the slits in those plastic sheets, or whatever they were. It was like they were alive, millions of feathery fingers clasping you and then letting go all at once, to close behind you with a snap.

When I went through the first one, it was noticeably cooler, and cooler still after the second one, and my ears popped. After the fourth one, it felt close to freezing, though the floor was still warm, and the air was noticeably thin; I was almost panting and could see my breath.

We stepped into a huge dark cavern. Rows of dim lights at about knee level marked off paths. The lights were all blue, but each path had its own kind of blue, different in shade or intensity. Meet me at the corner of bright turquoise and dim aquamarine.

I tried to remember our route, left at this shade of blue and then right at *this* one, but I was not sure how useful the knowledge would be. What, I was going to escape? Hold my breath and run back to the colony?

We went through a single sheet into a large area, at least as well lit as my hospital room and almost as warm. It had a kind of barnyard smell, not unpleasant. There were things that had to be plants all around, like broccoli but brown and gray with some yellow, sitting in water that you could hear was flowing. A little mist hung near the ground, and my face felt damp. It was a hydroponic farm like ours, but without greens or the bright colors of tomatoes and peppers and citrus fruits.

Green leaned over and picked something that looked like a cigar, or something even less appetizing, and offered it to me. I waved it away; she broke it in two and gave half to Red.

I couldn't tell how big the place was, probably acres. So where were all the people it was set up to feed? All the Martians.

I got a partial answer when we passed through another sheet, into a brighter room about the size of the new pod we'd brought. There were about twenty

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of the aliens arranged along two walls, standing at tables or in front of things like data screens, but made of metal rather than plastic. There weren't any chairs; I supposed quadrupeds don't need them.

They all began to move toward me, making strange noises, of course. If I'd brought one of them into a room, humans would have done the same thing, but nevertheless I felt frightened and helpless. When I shrank back, Red put a protective arm in front of me and said a couple of bullfrog syllables. They all stopped about ten feet away.

Green talked to them more softly, gesturing toward me. Then they stepped forward in an orderly way, by colors—two in tan, three in green, two in blue, and so forth—each standing quietly in front of me for a few seconds. I wondered if the color signified rank. None of the others wore red, and none were as big as Big Red. Maybe he was the alpha male, or the only female, like bees.

What were they doing? Just getting a closer look, or taking turns trying to destroy me with thought waves?

After that presentation, Red gestured for me to come over and look at the largest metal screen.

Interesting. It was a panorama of our greenhouse and the other parts of the colony that were above ground. The picture might have been from the top of Telegraph Hill. Just as I noticed that there were a lot of people standing around—too many for a normal work party—the *John Carter* came sliding into view, a rooster tail of red dust fountaining out behind her. A lot of the people jumped up and down and waved.

Then the screen went black for a few seconds, and a red rectangle opened slowly . . . it was the airlock light at night, as the door slid open. I was looking at myself, just a little while ago, coming out and pulling the dog behind me.

The camera must have been like those flying bugs that Homeland Security spies use. I certainly hadn't seen anything.

When the door closed, the picture changed to a ghostly blue, like moonlight on Earth. It followed me for a minute or so, stumbling and then staring at the ground as I walked more cautiously.

Then it switched to another location, and I knew what was coming. The ground collapsed and the dog and I disappeared in a shower of dust, which the wind swept away in an instant.

The bug, or whatever it was, drifted down through the hole to hover over me as I writhed around in pain. A row of glowing symbols appeared at the bottom of the screen. There was a burst of white light when I found the dog and switched it on.

Then Big Red floated down—this was obviously the speeded-up version—wearing several layers of that wall plastic, it seemed; riding a thing that looked like a metal sawhorse with two sidecars. He put me in one and the dog in the other. Then he floated back up.

Then they skipped all the way to me lying on that pillow, naked and unlovely, in an embarrassing posture—I blushed, as if any of them cared—and then moved in close to my ankle, which was blue and swollen. Then a solid holo of a human skeleton, obviously mine, in the same position. The image moved in the same way as before. The fracture line glowed red, and then my foot, below the break, shifted slightly. The line glowed blue and disappeared.

Just then I noticed it wasn't hurting anymore.

Green stepped over and gently took the staff away from me. I put weight on the foot and it felt as good as new.

"How could you do that?" I said, not expecting an answer. No matter how good they were at healing themselves, how could they apply that to a human skeleton?

Well, a human vet could treat a broken bone in an animal she'd never seen before. But it wouldn't heal in a matter of hours.

Two of the amber ones brought out

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my skinsuit and Mars suit, and put them at my feet.

Red pointed at me and then tapped on the screen, which again showed the surface parts of the colony. You could hardly see them for the dust, though; there was a strong storm blowing.

He made an up-and-down gesture with his small arms, and then his large ones, obviously meaning, "Get dressed."

So with about a million potato eyes watching, I took off the tunic and got into the skinsuit. The diaper was missing, which made it feel kind of baggy. They must have thrown it away—or analyzed it, ugh.

The creatures stared in silence while I zipped that up and then climbed and wiggled into the Mars suit. I secured the boots and gloves and then clamped the helmet into place and automatically chinned the switch for an oxygen and power readout, but of course it was still broken. I guess that would be asking too much—you fixed my ankle, but you can't fix a simple spacesuit? What kind of Martians *are* you?

It was obvious I wasn't getting any air from the backpack, though. I'd need the dog's backup supply.

I unshipped the helmet and faced Green, making an exaggerated pantomime of breathing in and out. She didn't react. Hell, they probably breathed by osmosis or something.

I turned to Red and crouched over, patting the air at the level of the dog. "Dog," I said, and pointed back the way we'd come.

He leaned over and mimicked my gesture and said, "Nog." Pretty close. Then he turned to the crowd and croaked out a speech, which I think had both "harn" and "nog" in it.

He must have understood, at least partly, because he made that four-armed "come along" motion at me and went back to the place where we'd entered. I went through the plastic and looked back. Green was leading four others, it looked like one of each color, following us.

Red in the lead, we all went back in what seemed the same path we'd come. I counted my steps, so that when I told people about it I'd have at least one actual concrete number. The hydroponics room, or at least the part we cut through, was 185 steps wide; then it was another 204 steps from there to the "hospital" room. I get about seventy centimeters to a step, so the trip covered about 270 meters, allowing for a little dogleg in the middle. Of course it might go on for miles in every direction, but at least it was no smaller than that.

We went into the little room and they watched while I unreeled the dog's umbilical and plugged it in. The cool air coming through the neck fitting was more than a relief. I put my helmet back on. Green stepped forward and did a pretty good imitation of my breathing pantomime.

I sort of didn't want to go. I was looking forward to coming back and learning how to communicate with Red and Green. We had other people more qualified, though. I should have listened to Mother when she got after me to take a language in school. If I'd known this was going to happen, I would have taken Chinese and Latin and Body Noises.

The others stood away from the plastic and Red gestured for me to follow. I pulled the dog along through the four plastic layers; this time we turned sharply to the right and started walking up a gently sloping ramp.

After a few minutes I could look down and get a sense of how large this place was. There was the edge of a lake—an immense amount of water even if it was only a few inches deep. From above, the buildings looked like domes of clay, or just dirt, with no windows, just the pale blue light that filtered through the door layers.

There were squares of different sizes and shades that were probably crops like the mushrooms and cigars, and one large square had trees that looked like

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six-foot tall broccoli, which could explain the wooden splints.

We came to a level place, brightly lit, that had shelves full of bundles of the plastic stuff. Red walked straight to one shelf and pulled off a bundle. It was his Mars suit. Bending over at a strange angle, bobbing, he slid his feet into four opaque things like thick socks. His two large arms went into sleeves, ending in mittens. Then the whole thing seemed to come alive and ripple up and over him, sealing together and then inflating. It didn't have anything that looked like an oxygen tank, but air was coming from somewhere.

He gestured for me to follow and we went toward a dark corner. He hesitated there and held out his hand to me. I took it, and we staggered slowly through dozens of layers of the stuff, toward a dim light.

It was obviously like a gradual airlock. We stopped at another flat area, which had one of the blue lights, and rested for a few minutes. Then he led me through another long series of layers, where it became completely dark—without him leading me, I might have gotten turned around—and then it lightened slightly, the light glowing pink this time.

When we came out, we were on the floor of a cave; the light was coming from a circle of Martian sky. When my eyes adjusted, I could see there was a smooth ramp leading uphill to the cave entrance.

I'd never seen the sky that color. We were looking up through a serious dust storm.

Red pulled a dust-covered sheet off his sawhorse-shaped vehicle. I helped him put the dog into one of the bowl-like sidecars, and I got in the other. There were two things like stubby handlebars in front, but no other controls that I could see.

He backed onto the thing, straddling it, and we rose off the ground a foot or so and smoothly started forward.

The glide up the ramp was smooth. I expected to be buffeted around by the dust storm, but as impressive as it looked, it didn't have much power. My umbilical tube did flap around in the wind, which made me nervous. If it snapped, a failsafe would close off the tube so I wouldn't immediately die. But I'd use up the air in the suit pretty fast.

I couldn't see more than ten or twenty feet in any direction, but Red, I hoped, could see farther. He was moving very fast. Of course, he was unlikely to hit another vehicle or a tree.

I settled down into the bowl—there wasn't anything to see—and was fairly comfortable. I amused myself by imagining the reaction of Dargo Solingen and Mother and Dad when I showed up with an actual Martian.

It felt like an hour or more before he slowed down and we hit the ground and skidded to a stop. He got off his perch laboriously and came around to the dog's side. I got out to help him lift it and was knocked off balance by a gust. Four legs were a definite advantage here.

He watched while I got the umbilical untangled and then pointed me in the direction we were headed. Then he made a shooing motion.

"You have to come with me," I said, uselessly, and tried to translate it into arm motions. He pointed and shoo-ed again, and then backed on to the sawhorse and took off in a slow U-turn.

I started to panic. What if I went in the wrong direction? I could miss the base by twenty feet and just keep walking on into the desert.

And maybe I wasn't even near the base. Maybe Red had left me in the middle of nowhere, for some obscure Martian reason.

That wouldn't make sense. Human sense, anyhow.

I stood alone in the swirling dust and felt helplessness turning into terror.

2. Homecoming

I took a few deep breaths. The dog was pointed in the right direction. I

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picked up its handle and looked straight ahead as far as I could see, through the swirling gloom. I saw a rock, directly ahead, and walked to it. Then another rock, maybe ten feet away. After the fourth rock, I looked up and saw I'd almost run into the airlock door. I leaned on the big red button and the door slid open immediately. It closed behind the dog and the red light on the ceiling started blinking. It turned green and the inside door opened on a wide-eyed Emily.

"Carmen! You found your way back!"

"Well, um . . . not really . . ."

"Got to call the search party!" She bounded down the stairs yelling for Howard.

I wondered how long they'd been searching for me. I would be in shit up to my chin.

I put the dog back in its place—there was only one other parked there, so three were out looking for me. Or my body.

Card came running in when I was half out of my skinsuit. "Sis!" He grabbed me and hugged me, which was moderately embarrassing. "We thought you were—"

"Yeah, okay. Let me get dressed? Before the shit hits the fan?" He let me turn around and step out of the skinsuit and into my coverall.

"What, you went out for a walk and got lost in that dust storm?"

For a long moment, I thought of saying yes. Who was going to believe my story? I looked at the clock and saw that it was 1900. If it was the same day, seventeen hours had passed. I *could* have wandered around that long without running out of air, using up the dog reserves.

"How long have I been gone?"

"You can't remember? All foogly day, man. Were you derilious?"

"Delirious." I kneaded my brow and rubbed my face hard with both hands. "Let me wait and tell it all when Mother and Dad get here."

"That'll be hours! They're out looking for you."

"Oh, that's great. Who else?"

"I think it was Paul the pilot."

"Well," said a voice behind me. "You decided to come back after all."

It was Dargo Solingen, of course. There was a quaver of emotion in her voice that I'd never heard. I think rage.

"I'm sorry," I said. "I don't know what I was thinking."

"I don't think you were thinking at *all*. You were being a foolish *girl*, and you put more lives than your own into danger."

About a dozen people were behind her. "Dargo," Dr. Jefferson said. "She's back, she's alive. Let's give her a little rest."

"Has she given *us* any rest?" she barked.

"I'm *sorry!* I'll do anything—"

"You will? Isn't that pretty. What do you propose to do?"

Dr. Estrada put a hand on her shoulder. "Please let me talk to her." Oh, good, a shrink. I needed a xenologist. But she would listen better than Solingen.

"Oh . . . do what you want. I'll deal with her later." She turned and walked through the small crowd.

Some people gathered around me and I tried not to cry. I wouldn't want *her* to think she had made me cry. But there were plenty of shoulders and arms for me to hide my eyes in.

"Carmen." Dr. Estrada touched my forearm. "We ought to talk before your parents get back."

"Okay." A dress rehearsal. I followed her down to the middle of A.

She had a large room to herself, but it was her office as well as quarters. "Lie down here," she indicated her single bunk, "and just try to relax. Begin at the beginning."

"The beginning isn't very interesting. Dargo Solingen embarrassed me in front of everybody. Not the first time, either. Sometimes I feel like I'm her little project. Let's drive Carmen crazy."

"So in going outside like that, you

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were getting back at her? Getting even in some way?"

"I didn't think of it that way. I just had to get out, and that was the only way."

"Maybe not, Carmen. We can work on ways to get away without physically leaving."

"Like Dad's zen thing, okay. But what I did, or why, isn't really important. It's what I *found!*"

"So what did you find?"

"Life. Intelligent life. They saved me." I could hear my voice and even I didn't believe it.

"Hmm," she said. "Go on."

"I'd walked four kilometers or so and was about to turn around and go back. But I stepped on a place that wouldn't support my weight. Me and the dog. We fell through. At least ten meters, maybe twenty."

"And you weren't hurt?"

"I *was!* I heard my ankle break. I broke a rib, maybe more than one, here."

She pressed the area gently. "But you're walking."

"They fixed . . . I'm getting ahead of myself."

"So you fell through and broke your ankle?"

"Then I spent a long time finding the dog. My suit light went out when I hit the ground. But finally I found it, found the dog, and got my umbilical plugged in."

"So you had plenty of oxygen."

"But I was freezing. The circuit to my gloves and boots wasn't working. I really thought that was it."

"But you survived."

"I was rescued. I was passing out and this, uh, this *Martian* came floating down. I saw him in the dog's light. Then everything went black and I woke up—"

"Carmen! You have to see that this was a dream. A hallucination."

"Then how did I get here?"

Her mouth set in a stubborn line. "You were very lucky. You wandered around in the storm and came back here."

"But there *was* no storm when I left! Just a little wind. The storm came up while I was . . . well, I was underground. Where the Martians live."

"You've been through so much, Carmen . . ."

"This was *not* a dream!" I tried to stay calm. "Look. You can check the air left in the tanks. My suit and the dog. There will be *hours* unaccounted for. I was breathing the Martians' air."

"Carmen . . . be reasonable . . ."

"No, *you* be reasonable. I'm not saying anything more until—" There was one knock on the door and Mother burst in, followed by Dad.

"My baby," she said. When did she ever call me that? She hugged me so hard I could barely breathe. "You found your way back."

"Mother . . . I was just telling Dr. Estrada . . . I didn't find my way back. I was brought."

"She had a dream about Martians. A hallucination."

"*No!* Would you just listen?"

Dad sat down cross-legged, looking up at me. "Start at the beginning, honey."

I did. I took a deep breath and started with taking the suit and the dog and going out to be alone. Falling and breaking my ankle. Waking up in the little hospital room. Red and Green and the others. Seeing the base on their screen. Being healed and brought back.

There was an uncomfortable silence after I finished. "If it wasn't for the dust storm," Dad said, "it would be easy to verify your . . . your account. Nobody could see you from here, though, and the satellites won't show anything, either."

"Maybe that's why he was in a rush to bring me back. If they'd waited for the storm to clear, they'd be exposed."

"Why would they be afraid of that?" Dr. Estrada asked.

"Well, I don't know. But I guess it's obvious that they don't want anything to

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do with us—"

"Except to rescue a lost girl," Mother said.

"Is that so hard to believe? I mean, I couldn't say three words to them, but they seemed to be friendly and good-hearted."

"It just sounds so fantastic," Dad said. "How would you feel in our position? By far the easiest explanation is that you were under extreme stress and—"

"*No!* Dad, do you really think I would do that? Come up with some elaborate lie?" I could see on his face that he did indeed. Maybe not a lie, but a fantasy. "There's objective proof. Look at the dog. It has a huge dent where it hit the ground in the cave."

"Maybe so; I haven't seen it," he said. "But being devil's advocate, aren't there many other ways that could have happened?"

"What about the *air?* The air in the dog! I didn't use enough of it to have been out so long."

He nodded. "That would be compelling. Did you dock it?"

Oh hell. "Yes. I wasn't thinking I'd have to *prove* anything." When you dock the dog it automatically starts to refill air and power. "There must be a record. How much oxygen a dog takes on when it recharges."

They all looked at each other. "Not that I know of," Dad said. "But you don't need that. Let's just do an MRI of your ankle. That'll tell if it was recently broken."

"But they *fixed* it. The break might not show."

"It will show," Dr. Estrada said. "Unless there was some kind of . . . magic involved."

Mother's face was getting red. "Would you both leave? I need to talk to Carmen alone." They both nodded and went out.

Mother watched the door close. "I know you aren't lying. You've never been good at that."

"Thanks," I said. Thanks for nothing.

"But it was a stupid thing to do, going off like that, and you know it."

"I do, I *do!* And I'm sorry for all the trouble I—"

"But look. I'm a scientist, and so is your dad, after a fashion, and so is almost everybody else who's going to hear this story today. You see what I'm saying?"

"Yeah, I think so. They're going to be skeptical."

"Of course they are. They don't get paid for believing things. They get paid for questioning them."

"And you, Mother. Do you believe me?"

She stared at me with a fierce intensity I'd never seen before in my life. "Look. Whatever happened to you, I believe one hundred percent that you're telling the truth. You're telling the truth about what you remember, what you believe happened."

"But I might be nuts."

"Well, wouldn't you say so? If I came in with your story? You'd say 'Mom's getting old.' Wouldn't you?"

"Yeah, maybe I would."

"And to prove that I wasn't crazy, I would take you out and show you something that couldn't be explained any other way. You know what they say about extraordinary claims?"

"They require extraordinary evidence."

"That's right. Once the storm calms down, you and I are going out to where you say . . . to where you fell through to the cave." She put her hand on the back of my head and rubbed my hair. "I so much want to believe you. For my sake as well as yours. To find life here."

3. The Dragon Lady

Paul was so sweet when he came in from his search. He hugged me so hard I cried out, from the rib, and then laughed. I'll always remember that. Me laughing and him crying, with his big grin.

For hours he had pictured me out

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there dead. Prepared himself for finding my body.

It was his for the asking. At least that hadn't changed.

Mother wanted to call a general assembly, so I could tell everybody the complete story, all at once, but Dargo Solingen wouldn't allow it. She said that children do stunts like this to draw attention to themselves, and she wasn't going to reward me with an audience. Of course she's an expert about children, never having had any herself. Good thing. They'd be monsters.

So it was like the whisper game, where you sit in a circle and whisper a sentence to the person next to you, and she whispers it to the next, and so on. When it gets back to you, it's all wrong, sometimes in a funny way.

This was not particularly funny. People would ask if I was really going around on the surface without a Mars suit, or think the Martians stripped me naked and interrogated me, or they broke my ankle on purpose. I put a detailed account on my website, but a lot of people would rather talk than read.

The MRI didn't help much, except for people who wanted to believe I was lying. Dr. Jefferson said it looked like an old childhood injury, long ago healed. Mother was with me at the time, and she told him she was absolutely sure I'd never broken that ankle. To people like Dargo Solingen that was a big shrug; so I'd lied about that, too. I think we won Dr. Jefferson over, though he was inclined to believe me, anyhow. So did most of the people who came over on the *John Carter* with us. They were willing to believe in Martians before they'd believe I would make up something like that.

Dad didn't want to talk about it, but Mother was fascinated. I went to talk with her at the lab after dinner, where she and two others were keeping a twenty-four-hour watch on an experiment.

"I don't see how they could be actual Martians," she said, "in the sense that we're Earthlings. I mean, if they evolved here as oxygen-water creatures similar to us, then that was three billion years ago. And, as you said, a large animal isn't going to evolve alone, without any other animals. Nor will it suddenly appear, without smaller, simpler animals preceding it. So they must be like us."

"From Earth?"

She laughed. "I don't think so. None of the eight-limbed creatures on Earth have very high technology. I think they have to have come from yet another planet. Unless we're completely wrong about areology, about the history of conditions on this planet, they can't have come from here."

"What if they used to live on the surface?" I said. "Then moved underground as the planet dried up and lost its air?"

She shook her head. "The time scale. No species more complicated than a bacterium has survived for billions of years."

"None on Earth," I said.

"Touché," she laughed. A bell chimed and she went to the other side of the room and looked inside an aquarium, or terrarium. Or ares-arium, here, I suppose. She looked at the things growing inside and typed some numbers onto her clipboard.

"So they went underground three billion years ago with the technology to duplicate what sounds like a high-altitude Earth environment. And stayed that way for three billion years." She shook her head. "The record in Earth creatures is a bacterium that's symbiotic with aphids. Genome hasn't changed in fifty million years."

She laughed. "This would be sixty times longer? For such a complex organism? And I still want to know where the fossils are. Maybe they dug them all up and destroyed them, just to confuse us?"

"But it's not like we've looked everywhere. Paul says it may be that life wasn't distributed uniformly, and we just haven't found any of the islands where

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things lived. The dinosaurs or whatever."

"Well, you know it didn't work that way on Earth. Fossils everywhere, from the bottom of the sea to the top of the Himalayas. Crocodile fossils in Antarctica."

"Okay. That's Earth."

"It's all we have. Coffee?" I said no and she poured herself half a cup. "You're right that it's weak to generalize from one example. Paul could very well be right, too; there's no evidence one way or the other.

"But look. We know all about one form of life on Mars: you and me and the others. We have to live in an artificial bubble that contains an alien environment, maintained by high technology, because we *are* the aliens here. So you stumble on eight-legged potato people who also live in a bubble that contains an alien environment, evidently maintained by high technology. The simplest explanation is that they're aliens, too. Alien to Mars."

"Yeah, I don't disagree. I know about Occam's Razor."

She smiled at that. "What's fascinating to me, one of many things, is that you spent hours in that environment and felt no ill effects. Their planet's very Earth-like."

"What if it *was* Earth?"

That stopped her. "Wouldn't we have noticed?"

"I mean a long time ago. What if they lived only on mountaintops and developed high technology thousands and thousands of years ago. Then they all left."

"It's an idea," she said. "But it's hard to believe that every one of them would be willing and able to leave—and that there would be no trace of their civilization, ten or even a hundred thousand years later. And where are their genetic precursors? The eight-legged equivalent of apes?"

"You don't really believe me."

"Well, I do; I do," she said seriously. "I just don't think there's an easy explanation."

"Like Dargo Solingen's? The Figment of Imagination Theory?"

"Especially that. People don't have complex consistent hallucinations; they're *called* hallucinations because they're fantastic, dreamlike.

"Besides, I saw the dog; you couldn't have put that dent in it with a lead-lined baseball bat. And she can't explain the damage to your Mars suit, either, without positing that you leaped off the side of a cliff just to give yourself an alibi." She was getting worked up. "And I'm your *mother,* even if I'm not a model one. I would goddamn remember if you had ever broken your ankle! That healed hairline fracture is enough proof for me—and for Dr. Jefferson and Dr. Milius and anybody else in this goddamn hole who didn't convict you before you opened your mouth."

"You've been a good mother," I said.

She suddenly sat up and awkwardly hugged me across the table. "Not so good. Or you wouldn't have done this."

She sat down and rubbed my hand. "But if you hadn't done it—" She laughed. "—how long would it have been before we stumbled on these aliens? They're watching us, but don't seem eager to have us see them."

The window on the wall was a greenboard of differential equations. She clicked on her clipboard and it became a real-time window. The storm was still blowing, but it had thinned out enough so I could see a vague outline of Telegraph Hill.

"Maybe tomorrow we'll be able to go out and take a look. If Paul's free, he'd probably like to come along; nobody knows the local real estate better than him."

I stood up. "I can hardly wait. But I *will* wait, promise."

"Good. Once is enough." She smiled up at me. "Get some rest. Probably a long day tomorrow."

Actually, I was up past midnight catching up on schoolwork, or not quite

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catching up. My brain wouldn't settle down enough to worry about Kant and his Categorical Imperative. Not with aliens out there waiting to be contacted.

4. Bad cough

Paul was free until 1400, so right after breakfast we suited up and equipped a dog with extra oxygen and climbing gear. He'd done a lot of climbing and caving on both Earth and Mars. If we found the hole—*when* we found the hole—he was going to approach it roped up, so if he broke through the way I had, he wouldn't fall far or fast.

I'd awakened early with a slight cough, but felt okay. I got some cough suppressant pills from the first-aid locker, chewed one, and put two in my helmet's tongue-operated pill cache.

We went through the airlock and weren't surprised to see that the storm had covered all my tracks, and everyone else's—including Red's; I was hoping that his sawhorse thing might have gouged out a distinctive mark when it stopped.

We still had a good chance of finding the hole, thanks to the MPS built into the suit and its inertial compass. I'd started counting steps, going west, when I set out from Telegraph Hill, and was close to five thousand when I fell through. That's about four kilometers, maybe an hour's walk in the daytime.

"So we're probably being watched," Mother said, and waved to the invisible camera. "Hey there, Mr. Red! Hello, Dr. Green! We're bringing back your patient with the insurance forms."

I waved, too, both arms. Paul put up both his hands palm out, showing he wasn't armed. Though what it would mean to a four-armed creature, I wasn't sure.

No welcoming party appeared, so we went to the right of Telegraph Hill and started walking and counting. A lot of the terrain looked familiar. Several times I had us move to the left or right when I was sure I had been closer to a given formation.

We walked a half kilometer or so past Paul's wrecked dumbo. I hadn't seen it in the dark.

Suddenly I noticed something. "Wait! Paul! I think it's just ahead of you." I hadn't realized it, walking in the dark, but what seemed to be a simple rise in the ground was actually rounded, like an overturned shallow bowl.

"Like a little lava dome, maybe," he said. "That's where you fell through." He pointed at something I couldn't quite see from my angle and height. "Big enough for you and the dog, anyhow."

He unloaded his mountaineering stuff from the dog, then took a hammer and pounded into the ground a long piton, which is like a spearpoint with a hole for the rope. Then he did another one about a foot away. He passed an end of the rope through both of them and tied it off.

He pulled on the rope with all his weight. "Carmen, Laura, help me test this." We did and it still held. He looped most of the rope over his shoulder and took a couple of turns under his arms and then clamped it through a metal thing he called a crab. It's supposed to keep you from falling too fast, even if you let go.

"This probably isn't all necessary," he said, "since I'm just taking a look down. But better safe than dead." He backed up the slight incline, checking over his shoulder, and then got on his knees to approach the hole.

I held my breath as he took out a big flashlight and leaned over the edge. I didn't hear Mother breathing, either.

"Okay!" he said. "There's the side reflector that broke off your dog. I've got a good picture."

"Good," I tried to say, but it came out as a cough. Then another cough, and then several, harder and harder. I felt faint and sat down and tried to stay calm. Eyes closed, shallow breathing.

When I opened my eyes, I saw specks of blood on the inside of my helmet. I

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could taste it inside my mouth and on my lips. "Mother, I'm sick."

She saw the blood and kneeled down next to me. "Breathe. Can you breathe?"

"Yes. I don't think it's the suit." She was checking the oxygen fitting and meter on the back.

"How long have you felt sick?"

"Not long . . . well, *now* I do. I had a little cough this morning."

"And didn't tell anybody."

"No, I took a pill and it was all right."

"I can see how all right it was. Do you think you can stand?"

I nodded and got to my feet, wobbling a little. She held on to my arm. Then Paul came up and held the other.

"I can just see the antenna on Telegraph Hill," he said. "I'll call for the jeep."

"No, don't," I pleaded. "I don't want to give the Dragon the satisfaction."

Mother gave a nervous laugh. "This is way beyond that, sweetheart. Blood in your lungs? What if I let you walk back and you dropped dead?"

"I'm not going to *die.*" But saying that gave me a horrible chill. Then I coughed a bright red string onto my faceplate. Mother eased me back down and awkwardly sat with my helmet in her lap while Paul shouted "Mayday!" over the radio.

"Where did they come up with that word?" I asked Mother.

"Easy to understand on a radio, I guess. 'Mo' dough' would work just as well." I heard the click as her glove touched my helmet. Trying to smooth my hair.

I didn't cry. Embarrassing to admit, but I guess I felt kind of important, dying and all. Dargo Solingen would feel like shit for doubting me. Though the cause-and-effect link there wasn't too clear.

I lay there trying not to cough for maybe twenty minutes before the jeep pulled up, driven by Dad. One big happy family. He and mother lifted me into the back and Paul took over the driving, leaving the dog and his climbing stuff behind.

It was a fast and rough ride back. I got into another coughing spasm and spattered more blood and goop on the faceplate.

Mother and Dad carried me into the airlock like a sack of grain and then were all over each other trying to get me out of the Mars suit. At least they left the skinsuit on while they hurried me through the corridor and mess area to Dr. Jefferson's aid station.

He asked my parents to step outside, set me on the examination table, and stripped off the top of the skinsuit, to listen to my breathing with a stethoscope. He shook his head.

"Carmen, it sure sounds as if you've got something in your lungs. But when I heard you were coming in with this, I looked at the whole-body MRI we took yesterday, and there's nothing there." He clicked on his clipboard and asked the window for my MRI, and there I was in all my transparent glory.

"Better take another one." He pulled the top up over my shoulders. "You don't have to take anything off; just lie down here." The act of lying down made me cough sharply, but I caught it in my palm.

He took a tissue and gently wiped my hand, and looked at the blood. "Damn," he said quietly. "You aren't a smoker. I mean on Earth."

"Just twice. Once tobacco and once pot. Just one time each."

He nodded. "Now take a really deep breath and try to hold it." He took the MRI wand and passed it back and forth over my upper body. "Okay. You can breathe now.

"New picture," he said to the window. Then he was quiet for too long.

"Oh my. What . . . what could that be?"

I looked, and there were black shapes in both of my lungs, about the size of golf balls. "What is . . . what are they?"

He shook his head. "Not cancer, not

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an infection, this fast. Bronchitis wouldn't show up black, anyhow. Better call Earth." He looked at me with concern and something else, maybe puzzlement. "Let's get you into bed in the next room, and I'll give you a sedative. Stop the coughing. And then maybe I'll take a look inside."

"Inside?"

"Brachioscopy, put a little camera down there. You won't feel anything."

In fact, I didn't feel anything until I woke up several hours later. Mother was sitting by the bed, her hand on my forehead.

"My nose . . . the inside of my nose feels funny."

"That's where the tube went in. The brachioscope."

"Oh, yuck. Did he find anything?"

She hesitated. "It's . . . not from Earth. They snipped off some of it and took it to the lab. It's not . . . it doesn't have DNA."

"I've got a Martian disease?"

"Mars, or wherever your potato people are from. Not Earth, anyhow; everything alive on Earth has DNA."

I prodded where it ached, under my ribs. "It's not organic?"

"Well, it is. Carbon, hydrogen, oxygen. Nitrogen, phosphorus, sulfur—it has amino acids and proteins and even something like RNA. But that's as far as it goes."

That sounded bad enough. "So they're going to have to operate? On both of my lungs?"

She made a little noise and I looked up and saw her wiping her eyes. "What is it? Mother?"

"It's not that simple. The little piece they snipped off, it had to go straight into the glove box, the environmental isolation unit. That's the procedure we have for any Martian life we discover, because we don't know what effect it might have on human life. In your case . . ."

"In my case, it's already attacked a human."

"That's right. And they can't operate on you in the glove box."

"So they're just going to leave it there?"

"No. But Dr. Jefferson can't operate until he can work in a place that's environmentally isolated from the rest of the base. They're working on it now, turning the far end of Unit B into a little self-contained hospital. You'll move in there tomorrow or the next day, and he'll take out the stuff. Two operations."

"Two?"

"The first lung has to be working before he opens the second. On Earth, he could put you on a heart/lung machine, I guess, and work on both. But not here."

I felt suddenly cold and clammy and I must have turned pale. "It's not that bad," Mother said quickly. "He doesn't have to open you up; he'll be working through a small hole in your side. It's called thorascopy. Like when I had my knee operated on, and I was just in and out. And he'll have the best surgeons on Earth looking over his shoulder, advising him."

With a half-hour delay, I thought. What if their advice was "No—don't do *that!*" Oops.

I thought of an old bad joke: Politicians cover their mistakes with money; cooks cover their mistakes with mayonnaise; doctors cover theirs with dirt. I could be the first person ever buried on Mars, what an honor.

"Wait," I said. "Maybe *they* could help."

"The Earth doctors? Sure—"

"No! I mean the aliens."

"Honey, they couldn't—"

"They fixed my ankle just like that, didn't they?"

"Well, evidently they did. But that's sort of a mechanical thing. They wouldn't have to know any internal medicine . . ."

"But it wasn't medicine at all, not like we know it. Those big lenses, the smoking herbs. It was kind of mumbo-jumbo,

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but it worked!"

There was one loud rap on the door, and Dr. Jefferson opened it and stepped inside, looking agitated. "Laura, Carmen—things have gone from bad to worse. The Parienza kids started coughing blood; they've got it. So I put my boy through the MRI, and he's got a mass in one of his lungs, too.

"Look, I have to operate on the Parienzas first; they're young and this is hitting them harder . . ."

"That's okay," I said. By all means, get some practice on someone else first.

"Laura, I want you to assist me in the surgery along with Selene." Dr. Milius. "So far, this is only infecting the children. If it gets into the general population, if *I* get it—"

"Alf! I'm not a surgeon—I'm not even a doctor!"

"If Selene and I get this and die, you are a doctor. You are *the* doctor. You at least know how to use a scalpel."

"Cutting up animals that are already dead!"

"Just . . . calm down. The machine's not that complicated. It's a standard waldo interface, and you have real-time MRI to show you where you're going."

"Can you hear yourself talking, Alphonzo? I'm just a biologist."

There was a long moment of silence while he looked at her. "Just come and pay attention. You might have to do Carmen."

"All right," Mother said. She looked grim. "Now?"

He nodded. "Selene's preparing them. I'm going to operate on Murray while she watches and assists; then she'll do Roberta while I observe. Maybe an hour and a half each."

"What can I do?" I said.

"Just stay put and try to rest," he said. "We'll get to you in three or four hours. Don't worry . . . you won't feel anything." Then he and Mother were gone.

Won't feel anything? I was already feeling pretty crappy. I get pissed off and go for a walk and bring back the Plague from Outer Space?

I touched the window and said "Window outside." It was almost completely dark, just a faint line of red showing the horizon. The dust storm was over.

The whole plan crystallized then. I guess I'd been thinking of parts of it since I knew I'd be alone for a while.

I just zipped up my skinsuit and walked. The main corridor was almost deserted, people running along on urgent errands. Nobody was thinking of going outside—no one but me.

If the aliens had had a picture of me leaving the base at two in the morning, before, then they probably were watching us all the time. I could signal them. Send a message to Red.

I searched around for a pencil to disable the airlock buzzer. Even while I was doing it, I wondered whether I was acting sanely. Was I just trying to escape being operated on? Mother used to say "Do something, even if it's wrong." There didn't seem to be anything else to do other than sit around and watch the situation deteriorate.

If the aliens were watching, I could make Red understand how serious it was. Whether he and Green could do anything, I didn't know. But what else was there? Things were happening too fast.

I didn't run into anyone until I was almost there. Then I nearly collided with Card as he stepped out of the mess hall bathroom.

"What you doing over here?" he said. "I thought you were supposed to be in sick bay."

"No, I'm just—" Of course I started coughing. "Let me by, all right?"

"No! What are you up to?"

"Look, microbe. I don't have time to explain." I pushed by him. "Every second counts."

"You're going outside again! What are you, crazy?"

"Look, look, look—for once in your life, don't be a . . ." I had a moment of desperate inspiration and grabbed him

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by the shoulders. "Card, listen. I need you. You have to trust me."

"What, this is about your crazy Martian story?"

"I can prove it's not crazy, but you have to come help me."

"Help you with what?"

"Just suit up and step outside with me. I think they'll come, the Martians, if I signal them, and they might be able to help us."

He was hesitant. I knew he only half believed me—but at least he did half believe me. "What? What do you want me to do outside?"

"I just want you to stand in the door, so the airlock can't close. That way the Dragon can't come out and froog the deal."

That did make him smile. "So what you want is for me to be in as deep shit as you are."

"Exactly! Are you up for it?"

"You are so easy to see through, you know? You could be a window."

"Yeah, yeah. Are you with me?"

He glanced toward the changing room, and then back down the hall. "Let's go."

We must have gotten me into my suit in ninety seconds flat. It took him an extra minute because he had to strip and wiggle into the skinsuit first. I kept my eye on the changing room door, but I didn't have any idea what I would say if someone walked in. Just a little incest?

My face plate was still spattered with dried blood, which was part of the vague plan: I assumed they would know that the blood meant trouble, and their bug camera, or whatever it was, would be on me as soon as I stepped outside. I had a powerful flashlight and would turn that on my face, with no other lights, then wave my arms, jump around, whatever.

We rushed through the safety check and I put two fresh oxygen bottles into the dog I'd bashed up. Disabled the buzzer, and we crowded into the airlock, closed it, and cycled it.

We'd agreed not to use the radio. Card signaled for me to touch helmets. "How long?"

"An hour, anyhow." I could walk past Telegraph Hill by then.

"Okay. Watch where you step, clumsy." I hit his arm.

The door opened and I stepped out into the darkness. There was a little light, actually; the Sun had just gone down.

Card put one foot out on the sand and leaned back against the door. He pantomimed looking at his watch.

I closed my eyes and pointed the light at my face. Bright red through my eyelids; I knew I'd be dazzled blind for a while after I stopped. So after I'd given them a minute of the bloody faceplate I just stood in one place and shined the light out over the plain, waving it around in fast circles, which I hoped would mean, "Help!"

I wasn't sure how long it had taken Red to bring me from their habitat level to the cave where he was parked, and then on to here. Maybe two hours? I hadn't been tracking too well. Without a dust storm it might be faster. I pulled on the dog and headed toward the right of Telegraph Hill.

The last thing I expected to happen was this: I hadn't walked twenty yards when Red came zooming up on his weird vehicle and stopped in a great spray of dust, which sparkled in the last light of dusk.

Card broke radio silence with a justifiable *"Holy shit!"*

Red helped me put the dog on one side and I got into the other and we were off. I looked back and waved at Card, and he waved back. The base shrank really fast and slipped under the horizon.

I looked forward for a moment and then turned away. It was just a little too scary, screaming along a few inches over the ground, missing boulders by a hair. The steering must have been automatic. Or maybe Red had inhuman reflexes.

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Nothing else about him was all that human.

Except the need to come back and help. He must have been waiting nearby.

It seemed no more than ten or twelve minutes before the thing slowed down and drifted into the slanted cave I remembered. Maybe he had taken a roundabout way before, to hide the fact that they were so close.

We got out the dog and I followed him back down the way we had come a couple of days before. I had to stop twice with coughing fits, and by the time we got to the place where he shed his Mars suit, there was a scary amount of blood.

An odd thing to think, but I wondered whether he would take my body back if I died here. Why should I care?

We went on down, and at the level where the lake was visible, Green was waiting, along with two small ones dressed in white. We went together down to the dark floor and followed blue lines back to what seemed to be the same hospital room where I'd first awakened after the accident.

I slumped down on the pillow, feeling completely drained and about to barf. I unshipped my helmet and took a cautious breath. It smelled like a cold mushroom farm, exactly what I expected.

Red handed me a glass of water and I took it gratefully. Then he picked up my helmet with his two large arms and did a curiously human thing with a small one: he wiped a bit of blood off the inside with one finger, and then lifted it to his mouth to taste it.

"Wait!" I said. "That could be poison to you!"

He set the helmet down. "How nice of you to be concerned," he said, in a voice like a British cube actor.

I just shook my head. After a few seconds I was able to squeak, "What?"

"Many of us can speak English," Green said, "or other's of your languages. We've been listening to your radio, television, and cube for two hundred years."

"But . . . before . . . you . . ."

"That was to protect ourselves," Red said. "When we saw you had hurt yourself and I had to bring you here, it was decided that no one would speak a human language in your presence. We are not ready to make contact with humans. You are a dangerous violent race that tends to destroy what it doesn't understand."

"Not all of us," I said.

"We know that. We were considering various courses of action when we found out you were ill."

"We monitor your colony's communications with Earth," one of the white ones said, "and saw immediately what was happening to you. We all have that breathing fungus soon after we're born. But with us it isn't serious. We have an herb that cures it permanently."

"So . . . you can fix it?"

Red spread out all four hands. "We are so different from you, in chemistry and biology. The treatment might help you. It might kill you."

"But this crap is sure to kill me if we don't do anything!"

The other white-clad one spoke up. "We don't know. I am called Rezlan, and I am . . . of a class that studies your people. A scientist, or philosopher.

"The fungus would certainly kill you if it continued to grow. It would fill up your lungs and you couldn't breathe. But we don't know; it never happens to us. Your body may learn to adapt to it, and it would be . . . illegal? Immoral, improper . . . for us to experiment on you. If you were to die . . . I don't know how to say it. Impossible."

"The cure for your *cheville?* Your . . . ankle was different," Green said. "There was no risk to your life."

I coughed and stared at the spatter of blood on my palm. "But if you don't treat me, and I die? Won't that be the same thing?"

All four of them made a strange

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buzzing sound. Red patted my shoulder. "Carmen, that's a wonderful joke. 'The same thing.'" He buzzed again, and so did the others.

"Wait," I said, "I'm going to *die* and it's funny?"

"No, no, *non,*" Green said. "Dying itself isn't funny." Red put his large hands on his potato head and waggled it back and forth, and the others buzzed.

Red tapped his head three times, which set them off again. A natural comedian. "If you have to explain a joke, it isn't funny."

I started to cry, and he took my hand in his small scaly one and patted it. "We are so different. What is funny . . . is how we here are caught. We don't have a choice. We have to treat you even though we don't know what the outcome will be." He buzzed softly. "But that's not funny to you."

"No!" I tried not to wail. "I can see this part. There's a paradox. You might kill me, trying to help me."

"And that's not funny to you?"

"No, not really. Not at all, really."

"Would it be funny if it was somebody else?"

"Funny? *No!"*

"What if it was your worst enemy? Would that make you smile?"

"No. I don't have any enemies that bad." Maybe one.

He said something that made the others buzz. I gritted my teeth and tried not to cry. My whole chest hurt, like both lungs held a burning ton of crud, and here I was trying not to barf in front of a bunch of potato-head aliens. "Red. Even if I don't get the joke. Could you do the treatment before I foogly die?"

"Oh, Carmen. It's being prepared. This is . . . it's a way of dealing with difficult things. We joke. You would say laughing instead of crying." He turned around, evidently looking back the way we had come, though it's hard to tell which way a potato is looking. "It is taking too long, which is part of why we have to laugh. When we have children, it's all at one time, and so they all need the treatment at the same time, a few hundred days later, after they bud. We're trying to grow . . . it's like trying to find a vegetable out of season? We have to make it grow when it doesn't want to. And make enough for the other younglings in your colony."

"The adults don't get it?"

He did a kind of shrug. "We don't. Or rather, we only get it once, as children. Do you know about whooping cough and measles?"

"What-sels?"

"Measles and whooping cough used to be diseases humans got as children. Before your parents' parents were born. We heard about them on the radio, and they reminded us of this."

A new green-clad small one came through the plastic sheets, holding a stone bowl. She and Red exchanged a few whistles and scrapes. "If you are like us when we are small," he said, "this will make you excrete in every way. So you may want to undress."

How wonderful. Here comes Carmen, the shitting, pissing, farting, burping, barfing human sideshow. Don't forget snot and earwax. I got out of the Mars suit and unzipped the skinsuit and stepped out of that. I was cold, and every orifice clenched up tight. "Okay. Let's go."

Red held my right arm with his two large ones, and Green did the same on the left. Not a good sign. The new green one spit into the bowl and it started to smoke.

She brought the smoking herb under my nose and I tried to get away, but Red and Green held me fast. It was the worst smelling crap you could ever imagine. I barfed through mouth and nose and then started retching and coughing explosively, horribly, like a cat with a hairball. It did bring up the two fungus things, like furry rotten fruit. I would've barfed again if there had been anything left in my stomach, but I decided to pass out instead.

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5. Invasion from Earth

I half woke up, I don't know how much later, with Red tugging gently on my arm. "Carmen," he said, "do you live now? There is a problem."

I grunted something that meant yes, I am alive, but no, I'm not sure I want to be. My throat felt like someone had pulled something scratchy and dead up through it. "Sleep," I said, but he picked me up and started carrying me like a child.

"There are humans from the colony here," he said, speeding up to a run. "They do not understand. They're wrecking everything." He blew through the plastic sheets into the dark hall.

"Red . . . it's hard to breathe here." He didn't respond, just ran faster, a rippling horse gait. His own breath was coming hard, like sheets of paper being ripped. "Red. I need . . . suit. Oxygen."

"As we do." We were suddenly in the middle of a crowd—hundreds of them in various sizes and colors—surging up the ramp toward the surface. He said three short words over and over, very loud, and the crowd stopped moving and parted to let us through.

When we went through the next set of doors I could hear air whistling out. On the other side my ears popped with a painful *crack* and I felt cold, colder than I ever had been. "What's happening?"

"Your . . . humans . . . have a . . . thing." He was wheezing before each word. "A tool . . . that . . . tears . . . through."

He set me down gently on the cold rock floor. I shuddered out of control, teeth chattering. No air. Lungs full of nothing but pain. The world was going white. I was starting to die, but instead of praying or something I just noticed that the hairs in my nose had frozen and were making a crinkly sound when I tried to breathe.

Red was putting on the plastic layers that made up his Mars suit. He picked me up and I cried out in startled pain—the skin on my right forearm and breast and hip had frozen to the rock—and he held me close with three arms while the fourth did something to seal the plastic. Then he held me with all four arms and crooned something reassuring to weird creatures from another planet. He smelled like a mushroom you wouldn't eat, but I could breathe again.

I was bleeding some from the ripped skin and my lungs and throat still didn't want to work, and I was being hugged to death by a nightmarish singing monster, so rather than put up with it all my body just passed out again.

I woke up to my lover fighting with Red, with me in between. Red was trying to hold on to me with his small arms while Paul was going after him with some sort of pipe, and he was defending himself with the large arms. "No!" I screamed. "Paul! No!"

Of course he couldn't hear anything in the vacuum, but I guess anyone can lip-read the word "no." He stepped back with an expression on his face that I had never seen. Anguish, I suppose, or rage. Well, here was his lover, naked and bleeding, in the many arms of a gruesome alien, looking way too much like a movie poster from a century ago.

Taka Wu and Mike Silverman were carrying a spalling laser. "Red," I said, "watch out for the guys with the machine."

"I know," he said, "We've seen you use it underground. That's how they tore up the first set of doors. We can't let them use it again."

It was an interesting standoff. Four big aliens in their plastic-wrap suits. Paul and my father and mother and nine other humans in Mars suits, armed with tomato stakes and shovels and one laser, the humans looking kind of pissed off and frightened. The Martians probably were, too. A good thing we hadn't brought any guns to this planet.

Red whispered. "Can you make them leave the machine and follow us?"

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"I don't know . . . they're scared." I mouthed "Mother, Dad," and pointed back the way we had come. "Fol-low us," I said with slow exaggeration. Confined as I was, I couldn't make any sweeping gestures, but I jabbed one forefinger back the way we had come.

Dad stepped forward slowly, his hands palm out. Mother started to follow him. Red shifted me around and held out his hand and my father took it and held his other one out for Mother. She took it and we went crabwise through the dark layers of the second airlock. Then the third and the fourth, and we were on the slope overlooking the lake.

The crowd of aliens we'd left behind was still there, perhaps a daunting sight for Mother and Dad. But they held on, and the crowd parted to let us through.

I noticed ice was forming on the edge of the lake. Were we going to kill them all?

"Pardon," Red muttered, and held me so hard I couldn't breathe, while he wiggled out of his suit and left it on the ground, then set me down gently.

It was like walking on ice—on *dry* ice—and my breath came out in plumes. But he and I walked together along the blue line paths, followed by my parents, down to the sanctuary of the white room. Green was waiting there with my skinsuit. I gratefully pulled it on and zipped up. "Boots?"

"Boots," she said, and went back the way we'd come.

"Are you all right?" Red asked.

My father had his helmet off. "These things speak English?"

Red sort of shrugged. "And Chinese, in my case. We've been eavesdropping on you since you discovered radio."

My father fainted dead away.

Green produced this thing that looked like a gray cabbage and held it by Dad's face. I had a vague memory of it being used on me, sort of like an oxygen source. He came around in a minute or so.

"Are you actually Martians?" Mother said. "You can't be."

Red nodded in a jerky way. "We are Martians only the same way you are. We live here. But we came from somewhere else."

"Where?" Dad croaked.

"No time for that. You have to talk to your people. We're losing air and heat and have to repair the door. Then we have to treat your children. Carmen was near death."

Dad got to his knees and stood up, then stooped to pick up his helmet. "You know how to fix it? The laser damage."

"It knows how to repair itself. But it's like a wound in the body. We have to use stitches or glue to close the hole. Then it grows back."

"So you just need for us to not interfere."

"And help, by showing where the damage is."

He started to put his helmet on. "What about Carmen?"

"Yeah. Where's my suit?"

Red faced me. I realized you could tell that by the little black mouth slit. "You're very weak. You should stay here."

"But—"

"No time to argue. Stay here till we return." All of them but Green went bustling through the airlock.

"So," I said to her. "I guess I'm a hostage."

"My English is not good," she said. *"Parlez-vous français?"* I said no. *"Ni-hongo de hanashimasu ka?"*

Probably Japanese, or maybe Martian. "No, sorry." I sat down and waited for the air to run out.

6. Zen for morons

Green put a kind of black fibrous poultice on the places where my skin had burned off from the icy ground, and the pain stopped immediately. That raised a big question I couldn't ask, hav-

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ing neglected both French and Japanese in school. But help was on its way.

While I was getting dressed after Green had finished her poulticing, another green one showed up.

"Hello," it said. "I was asked here because I know English. Some English."

"I—I'm glad to meet you. I'm Carmen."

"I know. And you want me to say my name. But you couldn't say it yourself. So give me a name."

"Um . . . Robin Hood?"

"I am Robin Hood, then. I am pleased to meet you."

I couldn't think of any pleasantries, so I dove right in: "How come your medicine works for us? My mother says we're unrelated at the most basic level, DNA."

"Am I 'DNA' now? I thought I was Robin Hood."

This was not going to be easy. "No. Yes. You're Robin Hood. Why does your medicine work on humans?"

"I don't understand. Why shouldn't it? It's medicine."

So much for the Enigmatic Superior Aliens theory. "Look. You know what a molecule is?"

"I know the word. Very small. Too small to see." He took his big head in two large-arm hands and wiggled it, the way Red did when he was agitated. "Forgive me. Science is not my . . . there is no word. I can't know science. I don't think any of us can, really. But especially not me."

I gestured at everything. "Then where did *this* all come from? It didn't just *happen.*"

"That's right. It didn't happen. It's always been this way."

I needed a scientist and they sent me a philosopher. Not too bright, either. "Can you ask her?" I pointed to Green. "How can her medicine work, when we're chemically so different?"

"She's not a 'her.' Sometimes she is, and sometimes she's a 'he.' Right now she's a 'what.'"

"Okay. Would you please ask it?"

They exchanged a long series of *wheedly-poot-rasp* sounds.

"It's something like this," Robin Hood said. "Curing takes intelligence. With Earth humans, the intelligence comes along with the doctor, or scientists. With us, it's in the medicine." He touched the stuff on my breast, which made me jump. "It knows you are different and works on you differently. It works on the very smallest level."

"Nanotechnology," I said.

"Maybe smaller than that," he said. "As small as chemistry. Intelligent molecules."

"You do know about nanotechnology?"

"Only from TV and the cube." He spidered over to the bed. "Please sit. You make me nervous, balanced there on two legs."

I obliged him. "This is how different we are, Carmen. You know when nanotechnology was discovered."

"End of the twentieth century sometime."

"There's no such knowledge for us. This medicine has always been. Like the living doors that keep the air in. Like the things that make the air, concentrate the oxygen. Somebody made them, but that was so long ago, it was before history. Before we came to Mars."

"Where *did* you come from? When?"

"We would call it Earth, though it's not your Earth, of course. Really far away, really long ago." He paused. "More than ten thousand ares."

A hundred centuries before the Pyramids. "But that's not long enough ago for Mars to be inhabitable. Mars was Mars a million ares ago."

He made an almost human gesture, all four hands palms up. "It could be much longer. At ten thousand ares, history becomes mystery. Our far-away Earth could be a myth, and the Others who created us. There aren't any spaceships lying around.

"What deepens the mystery is that we could never live on Mars, on the surface, but we *could* live on Earth, your Earth.

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So why did the Others bring us many light years just to leave us on the wrong planet?"

I thought about what Red had said. "Maybe because we're too dangerous."

"That's a theory. Or it might have been the dinosaurs. They looked pretty dangerous."

Dinosaurs. I took a deep breath. "Robin Hood. Have you, have your people, actually been on Mars that long? I mean, dinosaurs were on Earth a *long* time before people."

He wiggled his head again, with his big hands. "I don't *know*! You have to ask the story family, the history family. The yellow people?"

I remembered the two dressed in amber in that room where I was taken for inspection. "Okay. I'll ask a yellow person. So what do green people do? Are you doctors?"

"Oh, no." He pointed at the other. "It's green and it's a doctor. But why would you think that all of us greens are doctors? Every human I ever saw wears white, but I don't think therefore that you all have the same function."

Good grief. Was I the first cross-species racist? "I'm sorry. What is it that you do, then?"

He shuffled forward and back like a nervous spider. "I'm not a 'do'—" He put a small hand on my knee. "—I'm more a 'be.' You humans . . ." He touched his head with both large hands but didn't wiggle it. "You are all about what you *do*. Like, what do you *do*, Carmen?"

"I'm a student. I study things."

"But that's not a 'do' at all! That's a *be*, like me."

I was either out of my depth or into a profound shallowness. "So while you're . . . being, what do you . . . be? What do you be that's different from what others be?"

"You see? You see?" He emitted a sound like a thumbnail scraping across a comb. "'What do you *be*'—you can't even *say* it!"

"Robin Hood. Look. I'm both a do and a be—my 'be' is I'm a human being, female, American, whatever—it's what I am when I'm just standing here. But then I can go *do* something, like get a drink of water, and that doesn't change my *be* at all."

"But it *does!* It always does. Don't you see?"

Ontology, meet linguistics. Go to your corners and come out swinging. "You're right, Robin. You're absolutely right. We just don't put things quite that way."

"Put things?"

"We don't *say* it quite that way." I took a deep breath. "Tell me about these Others. They lived very far away?"

"Yes, very far. We used to call it something like the 'heaven' some humans talk about, but since we got TV and the cube, we know it's just really far away. Some other star."

"But you don't know which one."

"No, not which and not how long ago. But very far and very long. The story family says it was a time before time had meaning. The builder family says it must be so far away that light takes ares to get from that star to here. Because there are no stars any closer."

"That's interesting. You don't have telescopes and things, but you figured that out?"

"We don't need telescopes. We get that kind of knowledge from you humans, from the cube."

"Before the cube, though. They were up in heaven?"

"I guess so. We also learned about gods from you. The Others are sort of gods; they created us. But they actually exist."

Red suddenly appeared to rescue me from Sunday school. "Carmen, if you feel able, we'd like to have you up where we're working. The humans are not understanding us too well."

My experience with Robin Hood didn't make me too hopeful. But I could do "pick this up and put it there." I stepped into my suit and

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chinned the heat up all the way and followed him up to the cold.

7. Suffer the little children

The damage from the laser was repaired in a few hours, and I was bundled back to the colony to be rayed and poked and prodded and interviewed by doctors and scientists. They couldn't find anything wrong with me, human or alien in origin.

"The treatment they gave you sounds like primitive arm-waving," Dr. Jefferson said. "The fact that they don't know why it works is scary."

"They don't know why *anything* works over there. It sounds like it's all hand-me-down science from thousands of years ago. Ares."

He nodded and frowned. "You're the only data point we have. If the disease were less serious, I'd try to introduce it to the kids one at a time and monitor their progress. But there's no time. And everyone may have it already."

Rather than try to take a bunch of sick children over there, they invited the Martians to come to us. It was Red and Green, logically, with Robin Hood and an amber one following closely behind. I was outside, waiting for them, and escorted Red through the airlock.

Half the adults in the colony seemed crowded into the changing room for a first look at the aliens. There was a lot of whispered conversation while Red worked his way out of his suit.

"It's hot," he said. "The oxygen makes me dizzy. This is less than Earth, though?"

"Slightly less," Dr. Jefferson said. He was in the front of the crowd. "Like living on a mountain."

"It smells strange. But not bad. I can smell your hydroponics."

"Where are *les enfantes?*" Green said as soon as she was out of the suit. "No time talk." She held out her bag of herbs and chemicals and shook it.

The children had been prepared with the idea that these "Martians" were our friends and had a way to cure them. There were pictures of them and their cave. But a picture of an eight-legged potato-head monstrosity isn't nearly as distressing as the real thing—especially to a room full of children who are terribly ill with something no one can explain, but which they know is Martian in origin. So their reaction when Dr. Jefferson walked in with Dargo Solingen and Green was predictable—screaming and crying and, from the ambulatory ones, escape attempts. Of course the doors were locked, with people like me spying in through the windows, looking in on the chaos.

Everybody loves Dr. Jefferson, and almost everybody is afraid of Dargo Solingen, and eventually the combination worked. Green just quietly stood there like Exhibit A, which helped. It takes a while not to think of giant spiders when you see them walk.

They had talked about the possibility of sedating the children, to make the experience less traumatic, but the only data they had about the treatment was my description, and they were afraid that if the children were too relaxed, they wouldn't cough forcefully enough to expel all the crap. Without sedation, the experience might haunt them for the rest of their lives, but at least they would *have* lives.

They wanted to keep the children isolated, and both adults would have to stay in there for awhile after the treatment, to make sure they hadn't caught it, the Martians' assurances notwithstanding.

So the only thing between the child who was being treated and the ones who were waiting for it was a sheet suspended from the ceiling, and after the first one, they all had heard what they were in for. It was done in age order, youngest to oldest, and at first there was some undignified running around, grabbing the victims and dragging them to behind the sheet, where they volubly did the hairball performance.

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But the children all seemed to sleep peacefully after the thing was over, which calmed most of the others—if they were like me, they hadn't been sleeping much. Card, one of the oldest, who had to wait the longest, pretended to be unconcerned and sleep before the treatment. I know how brave that was of him; he doesn't handle being sick well. As if I did.

The rest of us were mostly crowded into the mess hall, talking with Red and Robin Hood. The other one asked that we call him Fly-in-Amber, and said that it was his job to remember, so he wouldn't be saying much.

Red said that his job, his function, was hard to describe in human terms. He was sort of like a mayor, a local leader or organizer. He also did things that called for a lot of muscular strength.

Robin Hood said he was being modest; for forty ares he had been a respected leader. When their surveillance device showed that I was in danger of dying, they all looked to Red to make the decision and then act on it.

"It was not a hard decision," he said. "Ever since you landed, we knew that a confrontation was inevitable. I took this opportunity to initiate it, so it would be on our terms. I couldn't know that Carmen would catch this thing, which you call a disease, and bring it back home with her."

"You don't call it a disease?" one of the scientists asked.

"No . . . I guess in your terms it might be called a 'phase,' a developmental phase. You go from being a young child to being an older child. For us, it's unpleasant but not life threatening."

"It doesn't make sense," the xenologist Howard Jain said. "It's like a human teenager who has acne, transmitting it to a trout. Or even more extreme than that—the trout at least has DNA."

"And you and the trout have a common ancestor," Robin Hood said. "We have no idea what we might have evolved from."

"Did you get the idea of evolution from us?" he asked.

"No, not as a practical matter. We've been crossbreeding plants for a long time. But Darwinism, yes, from you. From your television programs back in the twentieth century."

"Wait," my father said. "How did you build a television receiver in the first place?"

There was a pause, and then Red spoke: "We didn't. It's always been there."

"What?"

"It's a room full of metal spheres, about as tall as I am. They started making noises in the early twentieth century—"

"Those like me remembered them all," Fly-in-Amber said, "though they were just noises at first."

"—and we knew the signals were from Earth, because we only got them when Earth was in the sky. Then the spheres started showing pictures in mid-century, which gave us visual clues for decoding human language. Then when the cube was developed, they started displaying in three dimensions."

"Always been there . . . how long is 'always'?" Howard Jain asked. "How far back does your history go?"

"We don't have history in your sense," Fly-in-Amber said. "Your history is a record of conflict and change. We have neither, in the normal course of things. A meteorite damaged an outlying area of our home 4,359 ares ago. Otherwise, not much has happened until your radio started talking."

"You have explored more of Mars than we have," Robin Hood said, "with your satellites and rovers, and much of what we know about the planet, we got from you. You put your base in this area because of the large frozen lake underground; we assume that's why we were put here, too. But that memory is long gone."

"Some of us have a theory," Red said, "that the memory was somehow sup-

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pressed, deliberately erased. What you don't know you can't tell."

"You can't erase a memory," Fly-in-Amber said.

"*We* can't. The ones who put us here obviously could do many things we can't do."

"You are not a memory expert. I am."

Red's complexion changed slightly, darkening. It probably wasn't the first time they'd had this argument. "One thing I do remember is the 1950s, when television started."

"You're that old!" Jain said.

"Yes, though I was young then. That was during the war between Russia and the United States, the Cold War."

"You have told us this tale before," Robin Hood said. "Not all of us agree."

Red pushed on. "The United States had an electronic network it called the 'Distant Early Warning System,' set up so they would know ahead of time if Russian bombers were on their way." He paused. "I think that's what we are."

"Warning whom?" Jain said.

"Whoever put us here. We call them the Others. We're on Mars instead of Earth because the Others didn't want you to know about us until you had space flight."

"Until we posed a threat to them," Dad said.

"That's a very human thought." Red paused. "Not to be insulting. But it could also be that they didn't want to influence your development too early. Or it could be that there was no profit in contacting you until you had evolved to this point."

"We wouldn't be any threat to *them,*" Jain said. "If they could come here and set up the underground city we saw, thousands and thousands of years ago, light years from home, it's hard to imagine what they could do now. What they could do to us."

The uncomfortable silence was broken by Maria Rodriguez, who came down from the quarantine area. "They're done now. It looks like all the kids are okay." She looked around at all the serious faces. "I said they're okay. Crisis over."

Actually, it had just begun.

8. Ambassador

Which is how I would become an ambassador to the Martians. Everybody knows they didn't evolve on Mars, but what else are you going to call them?

Red, whose real name is Twenty-one Leader Leader Lifter Leader, suggested that I would be a natural choice as a go-between. I was the first human to meet them, and the fact that they risked exposure by saving my life would help humans accept their good intentions.

On Earth, there was a crash program to orbit a space station, Little Mars, that duplicated the living conditions they were used to. Before my five-year residence on Mars was over, I would be sent back there with Red and Green, along with four friends, who would be coordinating research, and Dargo Solingen, I guess because she was the only bureaucrat available on Mars.

Nobody wanted to bring the Martians all the way down to Earth quite yet. A worldwide epidemic of the lung crap wouldn't improve relations, and nobody could say whether they might harbor something even more unpleasant.

So as well as an ambassador, I became sort of a lab animal, under quarantine and constant medical monitoring, maybe for life. But I'm also the main human sidekick for Red and Green. Leaders come up from Earth to make symbolic gestures of friendship, even though it's obviously more about fear than brotherhood. When the Others show up, we want to have a good report card from the Martians.

We thought that would be be decades or centuries or even millennia—unless they had figured a way around the speed-of-light speed limit.

Or unless they were closer. ■

To be concluded.

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Axis, Robert Charles Wilson, Tor, $25.95, 303 pp. (ISBN: 0-7653-0939-4).

Empyre, Josh Conviser, Del Rey, $13.95, 277 pp. (ISBN: 978-0-345-48503-8).

The Third Lynx, Timothy Zahn, Tor, $24.95, 351 pp. (ISBN: 0-7653-1732-X).

The Mirror of Worlds, David Drake, Tor, $25.95, 333 pp. (ISBN: 0-7653-1260-3).

Slan Hunter, A. E. Van Vogt and Kevin J. Anderson, Tor, $24.95, 270 pp. (ISBN: 0-7653-1675-7).

Making Money, Terry Pratchett, HarperCollins, $25.95, 393 pp. (ISBN: 0-06-116164-0).

The Metatemporal Detective, Michael Moorcock, Pyr, $25.00, 327 pp. (ISBN: 978-1-59102-596-2).

The Girl Who Loved Animals and Other Stories, Bruce McAllister, Golden Gryphon Press, $24.95, 308 + xii pp. (ISBN: 978-1-930846-49-4).

Finding Magic, Tanya Huff, ISFiC Press, $30.00, 312 pp. (ISBN: 978-0-9759156-4-3).

Robert Charles Wilson's Hugo-winning *Spin* began with the premise that one night the stars went out and satellites fell out of the sky. A barrier had been erected around the Earth, presumably by aliens, whom folks soon agreed to call the Hypotheticals. In due time, folks learned that time outside the barrier was passing much, much faster than at home, and when they learned to get past it, they terraformed and colonized Mars and watched a new civilization grow in just a couple of subjective years. In due time, the barrier came down, Martians arrived on Earth bearing alarming technology derived from Hypothetical leavings, and an immense archway appeared in the Indian Ocean, through which one could sail a ship to a new world.

The sequel, **Axis**, is set on that new world, which Earth's industrial emissaries are busily stripping of oil, timber, and other resources. But that's not the story. The Martians' alarming technology included a means of extending human lifespan an extra 30–40 years; those who accept it are called Fourths, and they are persecuted by the Department of Genomic Security. Less well known is something that, when implanted in a human fetus, attunes the later child to the Hypotheticals. It was designed by scientists who hoped to devise a way to communicate with the aliens, and it didn't work on Mars. The axis of the tale is a debate over whether such communication is even possible. Are the Hypotheticals beings or mere process? Are they people with whom one might converse? Or are they the mindless result of Darwinian selection acting on self-reproducing machines? Do they have will and intention and purpose?

Now meet Isaac. He looks like a 12-year-old kid, but he has a strange ability to tell where West is and a yearning to go in that direction, toward the Rub al-Khali desert, which has lately been shaken by earthquakes. He's also been raised by a strange community of Fourths, led by Dr. Avram Dvali, to which a strange visitor, Sulean Moi, has just come. She came to meet Isaac, she tells him. And Hypothetical ashes fall from the sky like cometary dust, blocking roads, collapsing roofs, and sprouting weird life forms such as ocular roses.

Now meet Lise Adams, whose ex-husband works for Genomic Security. He's just a bureaucrat, not a persecutor. She is hunting for information about the father

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who disappeared when she was young. One of his friends was Avram Dvali, and she is hunting for him with the aid of a disreputable bush pilot, Turk Findley. Meanwhile, agents of Genomic Security—not bureaucrats!—are asking questions, and when a Fourth friend of Turk goes missing, Lise's ex learns that he has been killed.

No one but Isaac suspects that big things are stirring in the Rub al-Khali, but soon Lise, Turk, Sulean, Dvali and the Fourth community, and of course Isaac, are fleeing Genomic Security in that direction. Experienced readers will be expecting apotheosis for Isaac and great revelations about the Hypotheticals, and they won't be disappointed (though they won't get quite what they hope for).

I won't be a bit surprised if this one cops a Hugo too.

In *Echelon*, Josh Conviser supposed a U.S. government program to control the world by surveillance and by spotting and either co-opting or blocking new technological innovations. When Ryan Laing, once dead but revived with an infusion of nanotech "drones," and his operator, Sarah Peters, a gifted info-searcher and recognizer of patterns, discovered the conspiracy behind it all, it crashed. Its successor was **Empyre**, which used pinpoint terrorist attacks to tip nations and regions in directions favorable to U.S. interests. Nasty work, especially when Sarah is loaded with weaponized Ebola virus (without her knowledge) and used to unleash plague. Yet the agenda behind the virus is not that of Empyre, but of a mad genius, forged and honed by Echelon and Empyre, who thinks humanity needs a master. It's up to Ryan and Sarah to evade capture and death, to struggle with love and hate for each other, and to do their damnedest to end the threat to the world.

Empyre holds together much better than its predecessor, but there is a fundamental waitaminnit flaw. When Sarah is remotely triggered to shed virus, people instantly—within seconds—start dying very messily. No incubation period is necessary. Real viruses take time to show their effects; real Ebola takes 3–21 days. There is no such thing as an "instant" virus, nor is one possible since the small number of virus particles one acquires on exposure needs time to multiply to a level than can have effect. Granted that an instant virus is a gimmick that gives the plot a useful urgency, it is nonsense, and the kind of nonsense that makes a reader want to pitch the book across the room.

The plot hums right along, but the nonsense level says, "Skip it."

Timothy Zahn's sequel to *Night Train to Rigel*, **The Third Lynx**, is good fun. You may recall that *Rigel* involved interstellar passenger trains (run by the robotic Spiders) and a species of symbiotic coral, the telepathic group-mind known as the Modhri, created as a super-weapon by a long-extinct alien species and now bent on ruling the galaxy. Both elements are still here, unified by the race to find stolen sculptures dug up on a distant world. They aren't hugely valuable in and of themselves, but the curiosity value of the nine items, three each of lynxes, vipers, and hawks, has made them collectable. Unfortunately, all but one lynx have been burgled from their museums and collections by persons unknown.

Hero Frank Compton and Spider-linked Bayta are aboard the Quadrail when a stranger approaches, asking for help in buying an unnamed artwork. Soon the stranger is dead, he turns out to be a famous trillionaire, the artwork is the third Lynx, and the symbiotic Modhri, through its colonized "walkers," is clearly after it. It may have the other eight as well, though when Compton visits a museum that lost a viper, the viper turns out to have blown up.

Explosive sculptures? Aliens bent on galactic domination hunting eagerly for them? Clearly there is more here than meets the eye and it is very important to keep the sculptures out of Modhri-controlled hands. But Compton is dogged by

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a Terran intelligent agent who wants him arrested for murder. Life is also complicated by the hunt for the trillionaire's missing protégé, who may have the missing lynx in his keeping, and by Compton's strange romantic interest in the protégé's fiancée.

Needless to say, Zahn pulls all the pieces together and even provides at the end a fascinating hook on which to hang the next book in the series.

It's easy to see why David Drake's Lord of the Isles series is popular. If you have any taste at all for heroic fantasy, you'll love it.

The Mirror of Worlds is the second volume of his Crown of the Isles trilogy, which will conclude the series. The setting is a world wracked by the Change, which threw together patches of landscape from countless eras, complete with buildings and peoples, including the predatory cat-folk, the Coerli. The kingdom of the Isles has become a continent whose hope of peace rests with Prince Garric and his friends, once ordinary folk of the countryside in Haft, who are now struggling to bring humans and Coerli into a single folk when mysterious warriors start emerging from sacred pools when a strange star is high in the sky. They can be stopped by covering the pools, but not all pools are within reach. The Warriors, known as the Last, apparently come from far in the future when they have overrun the world and destroyed all that is human. Now they are here, and they threaten all. Can they be stopped?

The wizard Tenoctris goes seeking power and answers. Ilna, hunting Coerli to avenge past losses, finds an apparent survivor of a Coerli raid lying in a temple as if he were a fallen statue; answering just to "Temple," he will play a crucial role. Shin, an aegipan (we would call him a faun), appears to invite a human champion to trek to visit the legendary Yellow King; if he makes it, the Yellow King will help. Prince Garric agrees to go and soon acquires as a steed the ogress Kore, who made the mistake of breaking into a stable and dining on his horse. Garric's sister Sharina will be his regent, while her love Cashel assists Tenoctris in her perilous quests. A Coerli wizard, Rasile, serves Sharina as advisor while Tenoctris is away.

Drake's characters are appealing. He maintains momentum very well as he alternates among the various lines of the tale, bringing them steadily closer to the moment when they will join and together confront the threat of the Last. Reader interest stays high even though who wins is predictable, as is Drake's ushering from the wings the event that will motivate the next book.

The middle book of the last trilogy in a long-running series is not the best place to begin the series. But that's what I did, and Drake makes me want to read all the rest!

A. E. Van Vogt's *Slan* has been called a classic for a long time. When it first appeared in 1940, it resonated with SF fans. They were geeky misfits who felt superior to the rest of the world—the mundanes—but were nonetheless looked down upon. Van Vogt assured them of their superiority, and even today many fans call themselves slans. The original slans were smarter, stronger, healthier mutants who came equipped with golden tendrils dangling from the backs of their heads, which gave them telepathic powers. They could be spotted and slaughtered. There were also tendrilless slans that could fit in more easily. In a parallel with developments in pop culture, which has seen SF merge with film, TV, games, and mainstream fiction to the point where it can be hard to tell fans from mundanes, the tendrilless slans infiltrated society and took control of the media. They also plotted a sneak attack from their secret base on Mars, aiming to exterminate both true slans and humans and take over everything.

That's the theme of **Slan Hunter**, written by Kevin J. Anderson from materials left behind by Van Vogt. Jommy Cross, hero of the earlier book, is here again, but before we see him in action we must witness the persecution by the secret police

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(led by a classic mustachio-twirling villain, John Petty) of a human couple with a slan baby, the fall of secret slan and president of Earth, Kier Gray, to a secret police coup, and the villain's sneer's at Jommy's warning of a tendrilless attack from Mars. Jommy and Gray, along with Jommy's sweetheart and Gray's daughter Kathleen, are locked in cells deep beneath the palace. And that, of course, is precisely when the attack arrives and all Earth's defenses are shattered.

There's an awful lot of chestnuts in the fire, but that was Van Vogt's specialty, and his heroes never failed to pull them out before they were more than singed. So we know what Jommy must do, and we have faith that he will manage, even if there must be a massive *deus ex machina* at the end. So *Slan Hunter* successfully fits the classic mold. Unfortunately, that mold was broken a long time ago. The best adjective Anderson can earn today is "quaint," partly because he is obliged to be consistent with the technology of the original (remember carbon paper? Anderson's improvised justification does not convince).

If you share Anderson's love for the classic, or if you worship Van Vogt's memory the way his family does, you will enjoy *Slan Hunter*. Otherwise, you will not be impressed.

Terry Pratchett's Discworld series goes on and on, and the readers keep lapping them up with just as much reason as ever they did the works of the late P. G. Wodehouse, the equally British writer who invented Jeeves and may well have been an inspiration to Pratchett once upon a time. Pratchett has a tendency to tackle larger issues—such as labor and economics—but there is the same sort of British wit, the same fun to be had at the expense of upper-class nits, and a very similar sly mockery of convention. There is also considerable respect for feckless rogues such as Moist von Lipwig, who as Albert Spangler amassed a considerable stash by selling cheap diamonds (glass, really) to the gullible, among other cons. Albert's career ended on the gallows, but fortunately the Tyrant of Ankh-Morpork, Lord Vetinari, had a use for him, as recorded in *Going Postal* wherein Moist was induced to put the Post Office into more functional shape. He did such a fine job of it that now Lord Vetinari has another job for him: straightening out the Royal Bank.

As **Making Money** opens, Moist is bored. He craves excitement so much that he has taken up Extreme Sneezing, as well as picking his own locks. But he's smart enough to turn down the job, until sweet old Topsy Lavish, the bank manager, dies and leaves her half interest in the bank to her dog, and the dog to Moist, with certain requirements to be observed, or else.

The poor fellow's not bored anymore, not with Lavish kin gunning for him, an enamored golem jealous of his girlfriend, a mad scientist (and Igor) in the basement tending a fluidic device that models and sometimes controls the local economy, and an idea that a bank does not really need gold. Building on the success of his stamps, he invents paper money and proposes the gold standard be replaced with a labor standard. And it all works well enough that in due time, Lord Vetinari is mulling his next assignment (it's inevitable, you know, and the book is sure to be called *Death and Taxes*).

As usual, Pratchett does not disappoint. Enjoy!

I haven't seen much from Michael Moorcock in quite awhile, but he's still writing, and he's still working with his conception of the Eternal Champion incarnated as Beggs and von Beks and others again and again across the multiverse to fight the war of Law and Chaos with and against each other. Nor has he forgotten Elric the albino hero with the soul-eating sword, whom I understand is based on a Monsieur Zenith from Anthony Skene's Sexton Blake tales of the 1920s and 1930s.

We see it all in **The Metatemporal Detective**, which gathers eleven tales featuring a master detective, Seaton Begg

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(whose exploits are fictionalized as those of Sexton Blake), and his sidekick, pathologist Taffy Sinclair, who wander the multiverse fighting on the side of Law. There is an explicit affinity between Begg and Holmes. Sometimes Begg allies with Monsieur Zenith, sometimes he opposes. In some adventures he encounters Hitler as a wannabe politician, or a cop, or a terrorist, but never as the Hitler of our own world. Indeed, the worlds of the tales are very different from our own. Time is rubbery, so that tales can be set everywhen from the 1930s to the twenty-first century. Air transport is by zeppelin, engines are powered by electricity instead of gasoline, and the United States is broken into several different countries. Indeed, in "The Mystery of the Texas Twister" Texas is its own country, ruled by "King" George Washington Putz, who wants to steal the secrets of the internal combustion engine, powered by Texas oil, and the gyrocopter, engineer a war with the nation of California, and annex the neighbors, beginning with the idyllic democracy of Navajonia, all to enrich himself and his cronies. Somehow, Begg and his allies must put paid to the scheme.

The style is that of the old pulps, which is not surprising considering that they are dedicated to Moorcock's "boyhood hero . . . Anthony Skene." Interest is added by the strong links to Moorcock's body of previous work, as well as by the sly references to current events, both political ("King" Putz) and environmental (oil is bad, electricity is good).

Science fiction and fantasy are sometimes said to be engaged in the business of myth making. This is clearest when a work (such as Tolkien's *Lord of the Rings*) strikes a chord with the public, but it is also clear when a writer such as Moorcock builds a career—or at least a prolonged series—by elaborating on a vision. Others who have done this include Gordon Dickson, Kage Baker, Isaac Asimov, and many more. And it is interesting to note that some version of the Eternal Champion is often involved in such efforts.

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It's been almost twenty years since I reviewed Bruce McAllister's *Dream Baby* (in August 1990), but he's kept writing excellent stuff for the magazines. Much of it deals with issues connected to the Viet Nam War (as did *Dream Baby*, both the novel and the short version included here). Others, like the title story of **The Girl Who Loved Animals and Other Stories**, consider an all-too-likely future in which animals are going extinct and young street women can be offered employment as incubators for gorilla embryos.

No cybernetic heavens here. No dazzling military pyrotechnics. No wondrous aliens. McAllister's imagination stays close to home and focuses on the human element. There is warmth here, love for the human condition, and impressive literary polish.

Steven Silver of ISFiC Press in Illinois just sent along a copy of Tanya Huff's **Finding Magic**, published to coincide with the 2007 Windycon in Chicago, at which Huff was the guest of honor.

Huff is primarily a fantasy writer, in which role she has committed a couple of dozen novels for DAW and a slew of short stories. She is praised for her imagination, her realistic dialog, and her ability to get things right. I'm not that familiar with her work, so I started reading "I Knew a Guy Once," which is one of her few SF tales. The basic idea is fairly simple: a psychologist arrives on a space station to do something about rising stress levels, misbehavior, and general psychological bad vibes. The same ship brings a bartender, and Huff focuses all her attention on her efforts to clean up a bad bar and improve morale (since happy people drink more). The psychologist we don't see again till the very end, when he reveals that the problem he was supposed to solve has been solved, only he didn't do it. Ba-da-bum. Not exactly major, but very nicely, deftly done.

Huff is worthy of your attention. Enjoy. ■

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BRASS TACKS

Dr. Schmidt,

Normally I wouldn't write to complain about a story I didn't like. A story in your November 2007 issue raised my eyebrow, though. "Yearning for the White Avenger," by Carl Frederick is a nice work of fiction. I just fail to see how it qualifies as science fiction, no matter how broad your definition. In your June 2007 editorial you set out two guidelines for *Analog's* definition of science fiction. The first was that a story "should incorporate some element of scientific or technical speculation in way that is *integral* to the story." The only science that I can find in "White Avenger" (training a parrot) is neither speculative nor even particularly integral to the story. So, while I enjoyed the piece, I am left wondering how it made it into my monthly fix of science fiction.

Thanks for a great publication!

Chaim Schramm
Philadelphia, PA

The speculation is that an unprecedented level of communication with a member of a different species might be achieved by using a member of a third species as a "go-between." It's absolutely integral to the story because the way the plot plays out depends completely on that three-way communication.

Dr. Schmidt,

In "Adapting" (September 2007) and "Double Standard Required" (November 2007) you lay the blame for global warming on population growth. Given, we are discussing that part of global warming caused by human activity. If that is the null set, then the discussion is moot.

Like you, I doubt if global warming is a major tool in the toolbox of extinction. Reduced land and resources could trigger the Armageddon scenario, but I think there are far greater threats.

It is in the reaction to global warming that I perceive the greatest threat to the survival of the human race.

In your last editorial, you mentioned deforestation as a principal cause of global warming. I doubt that, because it has happened in the past without notable effect. The dying oceans are another matter.

By and large, it seems to me that the dominant factor in emissions is stored biocarbon. The stores of millions—no, hundreds of millions of years are spewing forth into the atmosphere. This is not the result of population, but of industry. Your math on resource utilization ignores the bucker paradigm. A bucket can only hold so much no matter what the rate of fill.

The first human population explosion was caused by agricultural technology. Not technology as we perceive it today, but technology nevertheless. It took humanity thousands of generations of time to reach that level of technology. The second human population explosion was the result of industrial technology. In blaming population for industry, we are putting the horse in front of the cart.

With current resources we can meet need, but there is no amount of resources that will meet appetite.

Human biology has not changed

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much in fifty thousand years. However, human culture has, and man is his culture. Biology determines the response to culture, and while man is not evolving, social orders are. This explains the Flynn Effect, which the Bell Curve could not.

Evolution is not concerned with the wellbeing of a species, either individually or collectively. Survival is the only relevant factor. Predacious human social orders tend to glamorize the process in favor of predators, but the top of the food chain is dependant on the bottom. Wolves are facing extinction while rabbits multiply to the point of nuisance.

So social orders compete and the survivors replace the failures, War is the ultimate arbitrator of this competition. It may not be used, but it sits in the judgment box waiting to be unleashed. It matters not how well a social order provides for the well being of its members: if it fails the test of war, it fails the evolutionary process.

As the technological acceleration increments, social orders become more and more dependant on the machine in the contest of survival. Those social orders that embrace the machine flourish, while those that do not are swept aside.

Eventually, social orders become social economic machines, mechanisms in which human judgment is replaced by mechanical response. If this seems a stretch, consider the present arguments over social economic policy. "Let the marketplace decide, because the marketplace is superior to human planning." No, those are not the exact words, but stripped of propaganda, that is what they mean.

As humanity advances in political skill in at best a linear rate, the machine advances at an exponential rate. The dominant social orders serve the machine, and this service is called progress. Few question the destination.

Soon only computers will be able to program computers, and soon thereafter, the machine will be self-sustaining.

Today it is the machine, not population, which generates industrial emissions. It seems clear to me that the machine can continue without population. Not only that, the machine can endure far greater environmental stress than humanity. What may be malignant to man might be benign to the machine. If I am correct, then why is population the dominant factor in industrial emissions?

I fail to concur as to the certain permanence of the Earth. Mass is fuel. If the machine decides to leave, it may not leave a planet behind. Even if it remains, is a machine a planet?

Respectfully,
Daniel Dempkey
El Centro, CA

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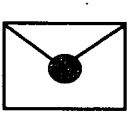

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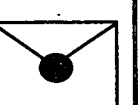

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UPCOMING EVENTS Anthony Lewis

16–18 November 2007
ORYCON 29 (Oregon SF conference) at Portland Marriott Waterfront, Portland, OR. Writer Guest of Honor: Robert Charles Wilson; Editor Guest of Honor: Liz Scheier; Artist Guest of Honor: Molly Harrison; Media Guests of Honor: Vic and Kelly Bonilla; Fan Guest of Honor: Jonas Saunders. Registration: $45 until 31 October, more later. Info: http://www.orycon.org/orycon29; orycon29@gmail.com;.OryCon 29, P.O. Box 5464, Portland, OR 97228-5464.

16–18 November 2007
PHILCON (Philadelphia SF conference) at Sheraton Philadelphia City Center, Philadelphia, PA. Principal Speaker: Eric Flint; Artist Guest of Honor: Sue Dawe; Costuming Special Guests: Kevin Roche & Andrew Trembly. Registration: $45 until 31 October, $50 thereafter and at the door. Info: www.philcon.org; info2007@philcon.org; Philcon, Box 8303, 30th Street Station, Philadelphia PA 19101.

23–25 November 2007
LOSCON 34 (Los Angeles area SF conference) at LAX Marriott, Los Angeles, CA. Writer Guest of Honor: Robert J. Sawyer; Artist Guest of Honor: Theresa Mathe; Fan Guest of Honor: Capt. David West Reynolds; Music Guest of Honor: Dr. James Robinson. Registration: $40 until 31 August, $45 until 31 October, $50 at the door. Info: loscon.org/34/index.html; info@loscon.org; Loscon 34, 11513 Burbank Blvd, North Hollywood CA 91601.

6–10 August 2008
DENVENTION III (66th World Science Fiction Convention) at Colorado Convention Center, Denver, CO. Hotels include Adam's Mark (party hotel), Hyatt Regency. Guest of Honor: Lois McMaster Bujold; Artist Guest of Honor: Rick Sternbach; Fan Guest of Honor: Tom Whitmore; TM: Wil McCarthy. Registration (until further notice; see website): USD 175; supporting membership USD 40; child (until 12 as of 6 August 2008) USD45. This is the SF universe's annual get-together. Professionals and readers from all over the world will be in attendance. Talks, panels, films, fancy dress competition—the works. Nominate and vote for the Hugos. Info: www.denvention3.org; president@denvention.org. Denvention 3, Post Office Box 1349, Denver, CO 80201 USA.

30 October–3 November 2008
WORLD FANTASY CONVENTION at Calgary, Alberta, Canada. Guests: TBA. Registration: Attending US $100 until 30 September 2007 (limit of 850), Supporting: US $35; additional for Awards Banquet US $50. Info: www.worldfantasy.org; info@worldfantasy2008.org; World Fantasy 2008, c/o The Story Box, 1835-10 Avenue SW, Calgary, Alberta T3C 0K2 Canada. ■

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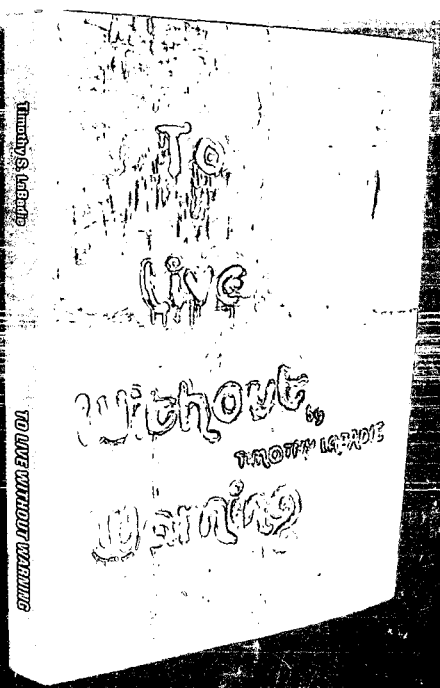

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